The Builder.

VOL. XXXIII. No. 1630. SATURDAY, APRIL 17, 1875.

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Ecclesiastical Architecture of Ireland.

THE work published under the above title* formed originally a series of papers contributed to our esteemed contemporary, the *Irish Builder*, under the head of "Notes on the Ancient Ecclesiastical Architecture of Ireland," now put into a more compact and permanent shape by the author, in the hope both of preserving a record of remains which are in a gradual progress of decay, and also of awakening in the younger members of the profession a greater amount of interest in the architectural remains of Ireland.

The effort to attract greater professional interest to these remains is certainly not superfluous, for it is unfortunate that hitherto Ireland, in regard to her architectural and antiquarian remains, has been the field of the amateur rather than of the professed architect. Mr. Hill's very able and thorough monograph of Cormac's Chapel, which we noticed some little time since (and to the excellence of which Mr. Brash bears his testimony) formed a recent exception; but for the most part Ireland has been architecturally a land of mystery, especially to students on this side of the Channel, whose ideas on the subject hardly get beyond a conviction that the country is full of extraordinary round towers whose use no one knows, and about which a score, or so of different contradictory theories have been framed. Lest any one should be intimidated by the threat of a further theory, we may say at once that Mr. Brash dismisses the round towers at the outset as, at all events, not "ecclesiastical" in their origin. But his earlier chapters are occupied with the consideration of structures almost as enigmatical and even more primitive than the towers. It is in order to refute the statement repeated by several previous writers on Irish archæology, that no indigenous stone architecture is known in the country previously to the ninth or tenth century, that the author commences by drawing attention to the great number of remains of an ancient form of fort, of what is known as the Cashel type (a thick, circular wall of masonry enclosing a space with a small building of a single chamber in the centre), which are distributed over the country in a manner which precludes any idea of their being the work, according to previous conjectures, of nomadic invaders. The masonry of these, though irregular in its construction, is so carefully and ably put together as to evince no little practice and experience in the art of building, and their date is at least prior to anything which can be called "history" in Ireland. From the existence of these remains, of which at the time of the Ordnance Survey there were 10,000 in the province of Munster alone, the author holds that there cannot be a doubt "that on the introduction of the Christian faith into Ireland its professors found no difficulty in procuring skilled masons competent to the erection of the moderate-sized churches then in fashion, and in doing so that they built not according to any imported style, but after the primitive models in use among them for ages long before." In short, the early ecclesiastical structures of Ireland give evidence, in their plain and simple features, of the same process which was carried out on so much greater a scale when the basilica of Rome was modified into the church. But there is another remarkable historical interest about these early castles or forts of Ireland, and the first simple oratory buildings which succeeded them and were founded on their style of construction. The similarity between these structures, and such early Pelasgic examples as the Treasury of Atreus, and the gateway and walls of Mycenæ, cannot fail to strike the architectural student at once in turning over the illustrations to the first two chapters of Mr. Brash's work. The author does not omit to allude to it, though of course anything more than an allusion would have been opening a subject beyond the range of his book, and far too large and suggestive to be treated of merely in passing. The flat-coursed dome, or arch, with the walls corbelling inwards to a pointed apex, is shown in the section of the oratory at Gallarus (county Kerry), the straight-sided arch formed on the same principle, in that of St. Molua's Oratory, Killaloe; and the elevation of the existing remains of that at Leabba Mollagga (county Cork), except for the smaller scale and more regular coursing of the masonry, might pass for a door and part of a wall from some newly-discovered remains at Mycenæ. Are we to put these structures back, in point of time, to the supposed period of the Pelasgic remains eastward of the Mediterranean, and suppose them built by a contemporary and related family of builders; or are we to conclude that these forms naturally present themselves in early masonic construction, as the most readily dealt with, and the most simple and obvious manner of using unhewn or roughly hewn stone? Under either supposition, the considerations involved are curious and interesting enough.

The oratories which form the prelude, so to speak, to Irish ecclesiastical architecture, are mostly of diminutive size, and in single chambers; they are most numerous in the south and west counties. A further apparent connexion with ancient Classic architecture may be traced, possibly, in the prolongation of the longer walls of the cell beyond the cross-walls at each end, forming a species of *antæ*, which are always built with great care, and with squared masonry, whatever the nature of the walls may be. "The doorway is usually in the west, and, when otherwise, it will be found to be a later insertion." (Here, as we may conclude, the first influence of ritual appears in these early buildings.) "These doors are a very remarkable feature; they are built of massive blocks, usually the full thickness of the wall, the jambs inclining inwards towards the top, and covered by a flat massive slab, as a lintel, also generally in one stone; in some cases the entire doorway is formed of three stones, as at St. Mollagga's." The older oratories are roofed with the straight-sided horizontally-coursed arch before mentioned, and have but one window, always in the east. The buildings which Mr. Brash terms "oratories of the second class," form the connecting link between the older oratories and the churches. In these buildings, which are somewhat larger, the true arch appears in the shape of a barrel vault, under the straight-coursed triangular stone roof. The vault, as the author observes, helps to support the stone roof; it may be also noticed (as we remarked in our mention of Mr. Hill's monograph of Cormac's Chapel), that the weight of the triangular roof upon the lower segments of the vault helps to keep that in its place, and explains the manner in which some of the larger structures of this kind have stood with so little buttressing to resist the thrust of the vault. St. Kevin's Oratory, Glendalough, is figured as a typical specimen of this class of structure; tradition, which gives the building to this saint, places him in the sixth century; but all that can fairly be said, perhaps, is that there is no valid reason against this date, or one nearly as early.

In his chapter on "The Primitive Churches," Mr. Brash avers that "in no country in Christendom can we trace the progress of ecclesiastical architecture from existing examples so clearly as in Ireland:" and though this is rather a round statement, and will certainly surprise some of his readers, we cannot but say that he shows cause for it, so far as the transition from the oratories to the first buildings that can be called churches, and in which the straight-sloped roof and barrel vault, the west doorway and east window, are still the prominent characteristics. Indeed, it is suggested that the predilection of the early Irish church-builders for the solid stone roof, which presented considerable practical difficulties on a large scale, was one of the influences which retarded the advancement of church-building in that country in regard to dimensions. But when we arrive at the point when "forms derived from a Pagan age came to be disused, and forms prevalent in the Christian architecture of other countries began to be adopted, though with strong national peculiarities," the author admits that we have very insufficient data for determining the period of this transition, "as our native annals seldom record the erection of churches, though they constantly refer to the casualties they sustained." The rise

* "The Ecclesiastical Architecture of Ireland, to the Close of the Twelfth Century; accompanied by interesting historical and antiquarian Notices of numerous ancient Buildings of that Period." By Richard Rolt Brash, architect, M.R.I.A., F.S.A., &c. Dublin: W. B. Kelly. London: Simpkin, Marshall, & Co.

of decorative architecture in Ireland has been very variously regarded as to its date and origin. Some of the previous amateur writers on the subject have made absurd errors in referring to the seventh and eighth centuries details which to the eye of the architect are at once seen to be connected with the style of the Norman and Transitional period. Opposed to this view is that which regards the decorative architecture of Ireland as derived in its main features from England in the Norman period: a conclusion which Mr. Brash, with a pardonable national feeling, seems disposed to resist as far as possible. But in looking at the doorways of Dysert and Clonkeen (plates xxiii., xxiv.), it is impossible to regard the details of the archivolts as of independent origin from those of English architecture of the Norman period. Mr. Brash wishes to argue that the geographical proximity of the islands could have little to do with any resemblance in their architecture, as there was little or no cordiality of intercourse between them during the early Gothic period. But builders and artists of all kinds have always been to a certain extent independent of mere political barriers, and it is impossible to suppose that those who built the Irish churches of the "Transitional" period were not acquainted with some part at least of the vast quantity of English work going on at the time. On the other hand, there is, combined with these distinctive features of Anglo-Norman architecture, a feeling and a character in some of the detail sufficiently distinct from anything English, and closely allied to that earlier Irish decorative art, of which specimens remain in such records as the Book of Kells, and in various instances of carved stonework in different parts of the country. When this, which is generally spoken of as a school of ornamental work indigenous to the country, comes to be worked out as a portion of architectural decoration, it is impossible not to be struck with its strong tinge of Oriental character. The strap ornament, as worked between the capitals, on the impost of the doorway of Killeshin Church, Queen's Co. (plate xxii.) has, in conjunction with the flowing ornament in the panel below, quite a Saracenic effect; the capitals of the west doorway of Temple Finghin, Clonmacnoise (plate xxvii.), preserve the outline of the Byzantine capital almost entirely. But perhaps the most noticeable example of this Oriental feeling is the extraordinary and (as far as we know) unique capital from the chancel arch of the Nuns' Church at Clonmacnoise (plate xxx.), which is totally unlike anything known in ordinary European Gothic, although the details of the archivolt decoration above might be assigned to such an example as the west door of Lincoln. These very extraordinary and unusual combinations of work belonging to two completely diverse schools of architectural ornamentation are exceedingly interesting, and well worth more attention than they have received at the hands of students of the history of architecture. The date of the Nuns' Church, one of the few early churches in Ireland of which the date can be accurately fixed, is the middle of the twelfth century.

Temple Finghin, Clonmacnoise, affords an opportunity of settling one of the arguments which has been used in favour of the ecclesiastical origin of the round towers, one of which is attached to this church, and was adduced by Dr. Petrie as an unanswerable proof of the correctness of his opinion in favour of such an origin of the round towers of Ireland. To the eye of the architect, Mr. Brash testifies, the evidence is just the other way; and, assuming the correctness of his representations, there can hardly be a doubt that he is right. In place of the tower being, as Dr. Petrie concluded, manifestly a portion of the edifice and built at the same time, it is evident to the practical architect that the tower existed previously, and was merely worked into the church in building. We may quote the author's own words on this point:—

"In the first place the courses of masonry in both buildings do not correspond, as would be the case were they jointly erected. Neither are they regularly bonded into each other, but the masonry of the church is *toothed* into that of the tower, a process known to masons when erecting a new building in connexion with an older one. Again, it is evident from the mode in which the roof is connected with the tower. Had they been coeval erections, a proper water-table would have been built into the wall of the tower, to protect the junction of the roof—a practice carefully attended to by all Mediæval builders. Instead of this, a chase was cut in the wall, and the roof let into it. Again, it is evident from an examination of the junction of the nave and chancel with the tower; the enlarged plan of this part clearly explains itself. After the church had been built against the tower, the builders found that the circular wall of the latter had an unsightly appearance in the angle of the nave" (the tower adjoins the south-east angle of the nave, close to the chancel arch), "or when erecting it they conceived that they could cut out that portion of the tower and so complete the angle of this part of the church. They accordingly commenced doing so by cutting the outer stones into two concentric circles; but having got through two-thirds of the thickness of the wall they were obliged to desist, as the tower had been so weakened by the necessary cutting for the connexion of the walls of the church, and by the proximity of the door, that it showed signs of giving way; as right over the angle of the nave is a settlement, and a crack in the tower—this crack has been closed externally as a part of the late repairs, but internally it is still quite visible. Not being able then to carry out their intention of completing the angle of the nave, they fashioned the masonwork into an angle pillar. The whole arrangement is still to be seen and examined; to the eye of the practical builder it tells its own tale as plainly as if he were looking at the whole operation."

Considerable space is devoted by Mr. Brash to the description and illustration of Cormac's Chapel, which, as we recently bestowed some space upon it (see *Builder*, vol. xxxii. p. 662), we must pass over, save with the remark that it appears to be the last and most important structure in which the old traditional method of building in Ireland was adhered to, before the Cistercians gave here, as they did wherever they went, a new impulse and almost a new era to ecclesiastical architecture. The system of the gabled stone roof could not very easily be carried out on a larger scale than it reached in this building, without at least very important modifications of structural design. The most important early Cistercian churches in Ireland are those of Mellifont, Boyle Abbey, and Jerpoint Abbey; the plans of the latter are given, and that of the octagonal building called, and probably with correctness, the baptistery of Mellifont. We have not space to follow the author through his remarks on these remains; but may call attention to his drawing of the capitals from Jerpoint (Pl. xlv.), two of which at least show a very unusual development of the semi-Norman scalloped capital, quite abnormal in character. The chapter on "Irish Masonry," as exhibited in the older masonic remains called *Raths*, and in the old stone-roofed (domical) huts of Connaught, illustrations of which are given, is of much interest; and again we are tempted to compare early Irish with what (for want of a better name) may be called Pelasgic masonry, in looking at the illustrations of the character of the former given on Plates li., lii. Few persons who have not been previously acquainted with ancient Irish work would suppose these to be specimens of any remains within the British Isles.

We should be glad, though it is a minor matter, if the book we have been noticing were free from those lapses of literary style and construction which architects who write seem to have such an unfortunate tendency to fall into. Or perhaps we do not know the language. Such a sentence as "the architectural student cannot fail with being struck," &c., may be good Irish, for aught we know to the contrary. It is certainly not English. But we heartily congratulate Mr. Brash on the result of his labours in a very interesting field of architectural study, and are glad to see that he proposes to return to the subject in a further work on the development of the Pointed style in Ireland. He is doing good service to all who are interested in architecture.

THE LOCAL GOVERNMENT BOARD AND THE WATER SUPPLY INQUIRY.

THE invitation given by the President of the Local Government Board, on the 2nd instant, to the deputation which waited upon him with reference to a Royal Commission on the Water Supply of the Country, for a statement of the points on which further inquiry would be useful, is not one that we can allow to pass without reply. At the risk, therefore, of repeating what must be familiar to many of our readers, we desire to attempt a sort of bird's-eye view of one part of the broad field which the Government are invited wisely and exhaustively to survey.

It must, in the first instance, be borne in mind that the insular condition and physical circumstances of the British Isles are such as to present the subject of water supply under a phase of great simplicity. We have no rainless districts. We have no parched and arid country that derives its entire supply of water from fountains fed by a distant rainfall. We are subject to no alternations of drought and of torrent, as are the lands watered by the mighty torrents of the Atbara and of the Uruguay. Every drop of water that feeds the springs of Great Britain falls in rain upon the surface of the island.

The first point, therefore, in an exhaustive inquiry into the water supply of the country, is to ascertain the annual movement of the rainfall. As to this, the considerable degree of information which we possess is due, almost entirely, to private enterprise, energy, and perseverance. To aid and render complete the method of local observation already pushed so far by Mr. G. J. Symonds and his allies; to associate the statistics of rainfall, when duly tabulated, with those other engineering facts to which we have to refer; and to make all this information freely accessible to the public, is the first *desideratum*. The price of the present annual Report on the rainfall, while far from being more than is warranted by the value of the work, is yet such as to keep it out of the hands of a large proportion of the public. We require to have monthly abstracts, gratuitously published in the newspapers, as to the movement of the water supply. It will thus be necessary to give such aid to an association that has already done so much for climatic science, as shall allow of the fullest and freest circulation of the important knowledge already in course of collection.

While we have, as before remarked, no rainless districts in this country, the distribution of the rainfall is marked by great inequality. Thus while the registered rainfall over the watershed of the Thames valley has been as low as 16·1 in. in a year (which was the case in the year 1832), the rain-gauge at the Styehead pass in the year 1872 registered the Tropical fall of 243·98 inches,—more than 20 ft. depth of water falling directly from the clouds! The distribution of this copious and varying supply is already given, to a certain extent, by the returns of Mr. Symonds. It will be requisite to give a completeness to this information, which amateur skill, however admirable, has not the means to compel. To ascertain the absolute distribution of the rainfall, referred to natural districts, indicated on maps that can be compared with those of the Ordnance survey, is a necessary step, before we can derive due information from the observations as to actual fall.

The third point requires organisation *ab initio*. It is the ascertaining of the evaporation. When we know how much rain falls, year after year, year by year, and month by month, on a given natural district, we shall want to know what becomes of the water. We know that, in one way or another, a large proportion of this water reaches the sea. We have to trace its course, that we may see how best to retain or to divert such quantities as we require for various purposes. We shall know the gross quantity, in each district, when the steps indicated in the preceding paragraph have been taken. But this is of little use unless we know also the net available quantity. The first deduction to be made from the former, in order to arrive at the latter, is the amount of evaporation.

As to this, our actual knowledge is not many degrees removed from absolute ignorance. The amateur energy which has done so much to supply the negligence of our central authorities as to rainfall has proved unable to conflict with the greater demands on skill, cost, and patience required for co-operative experiments. Eight series of observations of evaporation only were published in 1873. The result of the highest figures was five times that of the lowest; nor is this enormous irregularity, whether it occurs in fact, or whether it be a result of different and imperfect methods of observation, a question of *per mille*, or even of *per cent.* In the valley of the Colne, a well-known affluent of the Thames, the experiments of Mr. Dickinson show that some 60 per cent. of the entire rainfall is evaporated. The mean of a group of observations at Wisbeach, Bolton, and Manchester gives an evaporation of 58½ per cent. of the rainfall. But the evaporation cannot be expressed, in the actual state of our scientific knowledge, with any accuracy, as a per-centage of rainfall. It depends on so many other conditions, that the per-centage is only to be arrived at after numerous corrections. Indeed, it may be questioned whether there is any direct, and otherwise uninfluenced, natural relation, between the evaporative results of a given season and locality, and the rainfall observations for the same time and place.

It is, of course, the case that, to a certain extent, evaporation depends on rain. But it is only to a certain extent. Thus the most positive results as to the annual evaporation of a given district would be those derived from the surface of water. The evaporation from Windermere, or Ullswater, in twelve months, would

be very little affected by the quantity of rain which, during that time, fell on the surface of either lake. Again, if we compare equal areas of sand, of chalk, and of clay, the evaporation arising from an equal depth of rain falling upon each would be greatly different. It would be affected by the porous and thirsty nature of the soil. In one formation water is greedily swallowed before it has time to evaporate. In another, it is exposed to the vapourising rays of the sun, and to the lambent kisses of the winds. Variations of from 14 in. to 24 in. are shown in the few observations we now possess. It will require much more study before we are able even to know whether these are actual variations, or represent errors in observation. A thorough investigation of the general and special phenomena of evaporation is the third point on which information is needed. It is a point, unlike that of the amount and the distribution of rainfall, on which we are, even at this moment, confessedly quite in the dark.

When we are able to estimate the mean net rainfall of a district, we have to learn what becomes of the water. Here, again, scientific observation is in its infancy. It is obvious that we are now brought a third time to the same point. To give any real value to rainfall and evaporation statistics, we are taking for granted the availability of a map. We have, as we all know, in the Ordnance map, a scientific work of which the country may be justly proud. But the Ordnance map alone will not suffice for what we now require. It is at once too much and too little detailed. The Ordnance survey, however, will in great measure supply the materials for the WATER-SUPPLY MAPS. These will require to be drawn for their own special purpose, and no other. All those political details, so to speak, of towns, and roads, and inclosures, which form the very backbone of a map, topographically considered, are here unnecessary. Three points are requisite in a WATER-SHED MAP. We require, first, the delineation of the water-shed line, the edge of the collecting basin. To this should be added orographic heights, or references of the characteristic points to a given *datum*, such as Trinity high-water mark. Then we want the outfall lines to be marked with equal accuracy. Heights should be here also supplied, as well as the details of all artificial obstacles to outfall, such as mills and dams,—matters that will, before long, have to undergo a searching investigation. Thirdly, the geological formation must be indicated. Without this, knowledge of the physical outline of a country tells us comparatively nothing as to its water supply. The practised geologist, indeed, may be able to read between the lines of the Ordnance map, and to understand, from the accentuation of the slopes, on what system he is engaged. But this must not be left to hazard or to doubt. It is a part of the A B C of the matter. While, therefore, we have spoken first of rainfall, and of its distribution, and then of its evaporation, because, without knowing these details, we know nothing of the quantity of water which the soil is called on to absorb or to run off, it is obvious that an indispensable preliminary requisite for a systematic study of each of these important items, is the possession (that is to say the construction) of a good series of WATER-SUPPLY MAPS.

It may not be out of place here to remark that we have good reason for declining to trust to the effect of the famous rule of demand and supply for the preparation of these maps. Demand and supply ensure for the public maps made—to sell. If they do that, their object is answered. But that is not our object. We venture to suggest a simple rule, the adherence to which by all purchasers of maps would do more to improve this portion of graphic delineation than anything else that we can suggest. A map that is made with the purpose of communicating all the information possessed by its maker, in the best manner that he can command, ALWAYS BEARS ITS DATE ON ITS FACE. Its date is an essential portion of the information it should give. A map that does not bear it date on its face is a map made to sell. The only reason for the omission of the date is, that it is hoped that it will be bought by purchasers who would not buy it if they knew its real date. There can be little doubt that the mere acceptance, by Government or by public opinion, however expressed, of the necessity which we are now endeavouring to establish,—that of a series of WATER-SUPPLY MAPS, would produce a class of publications bearing that title. But we more than doubt whether that class would contain much solid grain in proportion to the chaff. The maps we require must be made by competent men, not for profit, but for scientific instruction. The cost to the country need not be large; since the information, for the most part, is already attainable. But the cost that would be saved by the employment of this method, whether measured in money, in time, or, in what is more precious than either, human health and life, is something that cannot readily be estimated.

The WATER-SUPPLY MAPS, then, while not altogether settling every question, would put before the engineer, the various local authorities, the Government, and the public, the means of advancing very far, and very rapidly, towards such a settlement.

Assuming, then, the preparation of a proper series of WATER-SUPPLY MAPS, we return to the question of absorption of water. This may be divided into two parts, namely, the absorption by organic beings, and that by the soil. The first of these is, to some extent, mixed up with the question of evaporation. Thus, the effect of a forest, or of a wide expanse of growing grass, or other vegetation, or evaporation, is considerable. We mention this as showing another source of difficulty in evaporative determination. But supposing that once arrived at, the total absorption by vegetation is a mensurable quantity. We can tell to a few pounds how much water is permanently absorbed by any crop. It comes into the scales at the harvest. How much has circulated through the intricate web of vessels, been absorbed by the roots, and breathed out by the leaves, is another matter. The water thus temporarily used by vegetables, and necessary for their growth, is out of all proportion to the quantity that remains chemically entangled in their growing tissue. The first must be included under the general mass of evaporated rainfall; the last only is a definite item of consumption.

So, again, with regard to the consumption of water by the species of the animal kingdom, a certain weight of water is converted into animal tissue. It is sold in the market in the form of beef and mutton. It is assimilated by the muscles of the rising youth. The greater demand, however, which is made by the animal world on the water supply of the districts which it inhabits, is temporary in its nature. The water thus used is not destroyed or evolved into its component gases. It is returned to the general system of aqueous circulation. It forms part of that outfall which reaches the sea; and the problem with regard to the quantity of water thus taken, is, how shall that circulation be so directed as to do the least amount of harm, and the greatest amount of good?

If we roughly average the mean rainfall of England as 36 in. of depth, we shall find that one per cent. of this quantity will supply 50 tons of water per head per annum to every human being in the island. A supply of this amount is not only very far in advance of the actual demands made by the population, but may be taken as a very sufficient allowance. If, for the remainder of the animal creation, we double that large proportion, we shall probably be very far outside the mark of either actual or probable demand. It is as to this TWO PER CENT. of our rainfall, *plus* the quantity last mentioned as required for the temporary and permanent purposes of vegetation, that all our trouble has to be taken.

It cannot be said that the problem, thus limited, is one before which the science of the day should stand aghast.

With regard to the absorption by the soil, this also comes under two heads. We may regard it, for the sake of clearness of thought (if not as a logical fact), as either temporary or permanent. We should call the temporary absorption that of those pervious soils which readily drink the rain, and allow it to sink to the impervious layer on which they rest. Bursting out again, in the form of springs and sources, from the lower lips of this impervious bed, the water rises to daylight; gives beauty to the landscape, and a home to the river-fish; collects into streams and rivers; and finally bears its stately course open and free to the sea.

But there is another system of pervious soils in which the action of the percolating water is very different. We refer, chiefly, to the upper, or flint-bearing, chalk. In this formation, which covers a very considerable part of the area of England, absorption of rain takes place almost as readily as in a sandy soil; but when the chalk has once absorbed the water, it is loth to let go its hold. It has an attraction for it which is probably due to some other cause than the simple mechanical structure of the stratum. So it is, however, that it retains large masses of water in a condition which may be compared to that of the spray of a waterfall. When you sink into the lower beds of the pervious chalk,—if the conformation of the country be not such as to assure a thorough drainage, as on the face of a chalk bluff,—you do not penetrate into water, but into something that is very damp. Leave a hole, and it will soon be found full of water. If we can conceive of the spray of a waterfall, distributed as a vast subterranean river, slowly making its way to the sea, we shall have a very adequate notion of what is going on under our feet in the valleys of the upper chalk. In the thorough investigation of this very important and interesting phenomenon lies the key to one very urgent class of water-supply problems.

Our readers will be now prepared for another suggestion. When we know how much rain annually falls on each naturally constituted water-shed district; when we know how much of this returns to the atmosphere by the process of evaporation; when we know how much is required for the vegetable, and for the animal kingdoms, for the farmer and for the sanitary engineer; when we know how the soil of each district will lend itself to the service of life, either by its pervious, its semi-pervious, or its impervious consistency; but one step, as matter of outline of organisation, will remain to be taken. That is, the grouping of the country into great WATER-SHED DISTRICTS. To these the water-supply maps will bear the same relation that the different parts of any great surveying operation do to the whole. We shall thus be prepared to deal at once with principle and with detail; to view the water-supply question as a whole, and to carry out every subordinate part to the minutest detail.

The general physical aspect of England is such as to suggest a primary division into ten water-supply provinces. We are not about now absolutely to insist on the number. But it has been arrived at not only as the result of much thought and study on the map, but as a consequence of personal acquaintance with each of the districts we have to indicate, either from residence, travel, or actual direction of important works within their limits.

These districts are delineated, in the first instance, by the physical conformation of the country. They form so many catch-water basins, chiefly drained either by one main outfall, or by a group of outfalls of the same character. While each, of course, must be expected to contain more than one geological system, the geological division will, as a rule, be found to coincide with the physical or orographical demarcation. For each of these ten districts, therefore, also as a general rule, will be required a different method of dealing with the general question. The ten outfalls and water-shed districts of England will form ten cases of the general question of the distribution and utilisation of the water supply of the country.

We have barely space to glance at the main characteristics of these districts. In that of the Tyne and Tees the rivers have cleft themselves deep and precipitous channels. Impervious and rocky hills throw down rapidly accumulating torrents. Supply is ample. The chief need of art is to prevent the waste of that supply, unused; and the fouling of the precious gifts of nature by the short-sighted greediness of man.

The district drained by the Humber reaches into the fertile plains of central England. It is characterised by softly-flowing streams, and richly-watered plains. It is less pressed upon by the needs of concentrated masses of people than some other districts. The removal of such obstacles as water-mills, and the avoidance of thriftless pollution of the rivers, are probably the most pressing points to regard in this district.

In the district drained by the Wash, and other semi-artificial outlets, we have the cradle of the hydraulic engineer. In these regions Englishmen emulate the industry and courage of the semi-amphibious Dutch; and learn to live and thrive at a level below low water-mark.

In the Thames district the great problems of hydraulic and sanitary works have advanced in a degree unknown to the rest of England. They are, however, very far from being solved. The utilisation of the under-current, through the flint-bearing chalk, for the purposes of human supply, is the step in this district which at the present moment chiefly demands elucidation.

The southern water-shed of England contains comparatively short river courses, and, while demanding a treatment peculiar to itself, is less

fertile in great problems than are either the more rapid or the more sluggish courses of other outfall systems.

The Devonian and Cornish district has a main water-shed to the South, with a less important fall on the north-west of its mountainous backbone. It joins the wide and important district of the Severn, which touches that of the Mersey and the Dee, shutting off to the west the separate district of the western portion of the principality.

Lastly, the Cumberland district contains most of those great natural reservoirs, the waters of which those who have not deeply studied the subject in all its bearings have proposed to carry across England, to feed the abundantly watered valley of the Thames.

Space forbids us now to add more. We hope that the points indicated will be taken up by those who have the ear of the Government and of the country; and that it may thus become evident, not only that there are great points on which inquiry is necessary, but that they are points on which a systematic and professionally well-directed scrutiny cannot fail to secure invaluable results.

SHAKSPEARE IN LONDON.

SHAKSPEARE was in London for a time, but he was not of it. He came to London to make his way in the world, and when he had attained his object he left it, apparently with pleasure. He was not a Londoner in the sense that his contemporary Ben Jonson was one, but still he has preserved in his plays many London localities and much London life. Amongst other places brought upon the stage are the palace at Westminster, the Tower of London, Baynard's Castle, Ely House, Holborn, the home of "time-honoured Lancaster," York Place, where the haughty Wolsey kept his court, and the ever-memorable Boar's Head in Eastcheap, frequented by that wonderful group of characters, with Falstaff at their head, in the description of whose symposia Shakspeare poured out the richest flow of his humour. Therefore, although we cannot tell for certain where Shakspeare lived in town, Elizabethan London has been fondly styled Shakspeare's London. It is true that most of the local incidents of the poet's life are associated with Stratford; but still he lived for several years in London, and a knowledge of the appearance of the city when he came up to Town will aid us somewhat in realising his life and character, for the surroundings help to form the man.

The first part of Mr. Halliwell's long-looked-for "Illustrations of the Life of Shakspeare" has just appeared, and as the author has devoted particular attention to the state of London in Shakspeare's time, we shall be able to draw from its pages several facts not hitherto known. We cannot tell the exact date of Shakspeare's arrival in London, but we can place it within certain limits. It was after the baptism of his first child, in May, 1583, and before 1592, when Robert Greene referred to him as an actor and writer. Most critics have chosen to place the composition of his earliest play in 1591, but this is mere surmise, and he had probably written plays before that year. What we desire to find out are the physical and moral features of London during the last quarter of the sixteenth century. Fortunately, about this time the first maps of the city were drawn, which give us as accurate a view of its figure as the contemporary writers do of the manners of its inhabitants. First of all we must bear in mind that, although the streets within the city walls were densely packed, places that are now integral parts of the town were then countrified suburbs. In Agas's map, Finsbury-fields, Moorfields, Spitalfields, and East Smithfield are covered with windmills, and appear to have been used partly as bleaching-grounds for the laundress, and partly as grazing land for the cattle.

London has always appeared to the imagination of the adventurous country youth to be the home of golden promise. If he can only get there, he believes that his successful career has commenced; but it appears that in Elizabeth's reign there was pretty much the same difficulty in obtaining employment as there is now. This is illustrated by a curious account of the early life of John Sadler, a native of Stratford-on-Avon, and one of Shakspeare's contemporaries, which has come down to us:—"He joined himself to the carrier, and came to London, where he had never been before, and sold his horse in Smithfield; and having no acquaintance in London to recommend him or assist him, he went from street to street, and house to house, asking if they wanted an apprentice, and though he met with many discouraging scorns and a thousand denials, he went on till he lighted on one Mr. Brokesbank, a grocer in Bucklersbury, who, though he long denied him for want of sureties for his fidelity, and because the money he had (but ten pounds) was so disproportionate to what he used to receive with apprentices, yet, upon his discreet account he gave of himself and the motives which put him upon that course, and promise to compensate with diligent and faithful service whatever else was short of his expectation, he ventured to receive him upon trial, in which he so well approved himself that he accepted him into his service, to which he bound him for eight years." The stage was highly popular at this time, and we have the authority of a letter from a zealous Protestant to Sir Francis Walsingham (dated Jan. 25, 1586-7) for the fact that "every day in the weeke the playeres billes are sett upp in sondry places of the cittie, some in the name of her Majesties menne, some the Earle of Leic[ester], some the E. of Oxfordes, the Lord Admyralles, and dyvers others, so that when the belles toll to the lectoures, the trumpettes sound to the stages, whereat the wicked faction of Rome lawgheth for joy, while the godly weepe for sorowe. Woe is me, the playhouses are pestered when the churches are naked. At the one it is not possible to gett a place; at the other, voyde seates are plentie. . . Yt is a wofull sight to see two hundred proude players jett in theire silks, wheare fyve hundred pore people sterve in the streetes." As a consequence of this popularity many of the actors became rich, but although the profession required no capital and but little apprenticeship, it is quite possible that those who were reaping the harvest were not too anxious to welcome volunteers to their ranks. When Shakspeare came to London there were only two regular theatres on the north of the Thames, although it is true that inn-yards and other buildings occasionally were used for dramatic exhibitions. These two places of entertainment—the Theatre and the Curtain—were both situated in the suburbs at Shoreditch, then a straggling road leading to St. Leonard's Church, which stood among the trees. The players had reason for their settlement beyond the jurisdiction of the rulers of the City, for the Mayor and Corporation were violently opposed to all theatrical representations, but the actors found that even in Shoreditch they were not beyond the reach of persecution. In Stockwood's sermon, preached at Paul's Cross on the 24th of August, 1578, the playhouses are very hardly dealt by. The preacher says,—"What should I speake of beastlye playes, againste which out of this place every man crieth out? Have we not houses of purpose built with great charges for the maintainance of them, and that without the Liberties, as who would say,—There, let them saye what they will saye, we will play. I know not how I might with the godly learned especially more discommende the gorgeous playing-place *erected in the fieldes* than to terme it, as they please to have it called, a theatre, that is even after the maner of the olde heathnish theatre at Rome, a shew-place of al beastly and filthie matters, to the which it can not be chosen that men should resort without learning thence muche corruption." Not only were the theatres condemned as centres of a moral plague, but they were prohibited as the cause of physical infection. On May 3, 1583, the Lord Mayor wrote as follows to Sir Francis Walsingham,—"Among other we finde one very great and dangerous inconvenience, the assemblie of people to playes, beare-bayting, fencers, and prophane spectacles at the Theatre and Curtaine, and other like places, to which doe resorte great multitudes of the basest sort of people, and many enfected with sores runing on them, being out of our jurisdiction, and some whome we cannot descerne by any diligence, and which be otherwise perilous for contagion, beside the withdrawing from God's service, the peril of ruines of so weake byldinges, and the avancement of incontinencie and most ungodly confederacies." No doubt the quiet manor of Shoreditch was not morally improved by the settlement of the players in its midst; and we know that the place became notorious for the bad character of its female population. Mrs. Millwood, the ever memorable seducer of George Barnwell, lived "next door unto the Gun," in Shoreditch, and the old literature bears abundant testimony to the bad repute in which many of the houses were held. We forget this now, and only remember that the parish register of St. Leonard's records the burial of Will Somers the jester, Richard Tarlton, the clown, James Burbage, the builder of the Theatre, and his greater son, Richard Burbage, the actor of Shakspeare's heroes. Mr. Halliwell has collected a considerable amount of interesting information bearing upon the origin of the Theatre and the Curtain, which illustrates the history both of London and of the stage. In the marshy grounds situated to the west of the High-street, leading from Norton Folgate to Shoreditch Church, sprang a sacred well or fountain, which gave its name to the liberty of Halliwell or Holywell. The lands in which the well was situated belonged to the Priory of Holywell until the dissolution of the monasteries, in the reign of Henry VIII. In the year 1576, a small portion of the estate belonged to one Giles Allen, who leased houses and land situated between Finsbury-field and the public road to the Church, to James Burbage, a joiner by trade, but at this time a leading member of the Earl of Leicester's Company of Players. Burbage seems to have been a practical man, and covenanted with Allen that if he expended 200*l.* upon the buildings already on the estate, he should be at liberty "to take downe and carrie awaie to his and their owne proper use all such buildinges and other thinges as should be builded, erected, or sett upp, in or uppon the gardeines and voide grounde by the said indentures graunted, or anie parte therof, by the said Jeames, his executors, or assignes, either for a theatre or playinge-place, or for anie other laweful use for his or their commodities." He gave a premium of 20*l.* for a lease of twenty-one years, at an annual rent of 14*l.*, and very soon had his house ready; this being, as Mr. Halliwell says, "the earliest fabric of the kind ever built in this country," was emphatically styled "The Theatre." In the summer of 1577 it was a favourite resort; but on the 1st of August the Lords of the Privy Council closed it "for thavoiding of the sicknes likelie to happen through the heate of the weather and assemblies of the people of London to playes." Burbage died in 1579, and soon afterwards the Theatre was closed, as we learn from "Skialetheia," published in 1598, where we read:—"But see yonder,—one, like the unfrequented Theater,—walkes in darke silence and vast solitude." Previously to his death, negotiations were pending with Allen for an extension of the lease, but no agreement was come to, and, therefore, Cuthbert and Richard Burbage (to whom their father James had transferred the property) removed the "wood and timber," in accordance with the terms of the lease in December, 1598, or January, 1599. The Burbages engaged Peter Streete, builder and carpenter, to remove the building to Southwark, where the materials were used in the construction of the "Globe." The "Curtain" enjoyed a longer life than "The Theatre," for it appears to have been commenced very shortly after that place, and to have continued in use until Charles I.'s reign. The earliest notice of this theatre by name occurs in Northbrooke's "Treatise on Dicing, &c.," licensed in December, 1577, where we read, "Doe you speake against those places also which are made uppe and builded for such playes and enterludes, as the Theatre and the Curtaine is, and other such lyke places besides." It has been supposed by some that the name of the house was derived from the fact of a curtain being then a novelty among stage properties, and Aubrey speaks of the place as the "Green Curtain"; but documents prove that a piece of ground belonging to the Priory of Holywell, upon which this theatre was built, was named the "Curtain." As both these theatres were situated close to Holywell-lane, which still exists, there is little difficulty in realising their relative positions. The site of the Theatre was a little to the north of the lane, near what is now Deane's-mews. The little entry out of Curtain-road, now known as Gloucester-street, but called in 1745 "Curtain-court," marks the site of the Curtain Theatre. We thus see that the back of the present Standard Theatre is only a short distance from the classic ground where the first London theatres were built. In the olden time plays were acted in the afternoon, and, therefore, the audiences who passed through the meadows on their way to the theatre had no unpleasant walk, if the weather was fine. Sometimes, however, it was the reverse, and the frequenters of the pit had then some reason to complain. The author of "Jack Dawe's Prog-

nostication" (1623) writes, "If, at this time, about the houres of foure and five, it waxe cloudy, and then raine downeright, they shall sit drier in the galleries than these who are the understanding men in the yard." The roofs of both the Theatre and the Curtain merely covered the stage and galleries, and the yard was therefore left open to the sky. The charge for admission to the yard was one penny, but those who wanted a seat in the gallery had to pay an extra fee. Lambard, in his "Perambulation of Kent" (1596), informs us that none who go "to Paris Gardein, the Bell Savage, or Theatre, to behold beare baiting, enterludes, or fence play, can account of any pleasant spectacle unlesse they first pay one pennie at the gate, another at the entrie of the scaffolde, and the thirde for a quiet standing." As we have before noted, Shakspeare's arrival in London could not well have been later than the year 1591, and Mr. Halliwell has conclusively proved that at that time there were only two regular theatres in London. On the strength of a forged document, the building of the Blackfriars Theatre has been placed in the year 1576, but it really did not come into existence until twenty years afterwards, and the Rose at Southwark, although contemplated in 1586, was not opened until early in 1592. The Paris Garden building, although erected in Henry VIII.'s reign for bull and bear baiting, was only converted into a theatre in James I.'s reign.

Now, as no one has doubted that Shakspeare's first occupation in London was connected with the stage, we see that he must have been employed either at the Theatre or Curtain, or at both. There is, however, a difference of opinion as to what his duties were, and Mr. Halliwell believes in the tradition, which he traces back to Sir William Davenant, that Shakspeare stood at the playhouse-door and held the horses of visitors during the hours of performance. It is by no means proved that the poet left Stratford in abject poverty; and his early acquaintance with the actors that visited his native town would be more likely to help him to an introduction to the inside than to the outside of the theatre. With his powers as an actor and author, it seems hardly conceivable that, when once introduced, he should not have been cordially welcomed. Of course those who believe in the tradition must place Shakspeare's coming to London long before 1591, because in 1592 the popularity of his pieces had made some of the writers in possession of the stage jealous with the fear that they would be thrown in the shade by the rising sun. Before April, 1597, "Romeo and Jul et" had been acted at the Curtain Theatre, by the Lord Chamberlain's servants, and as early as December, 1594, Shakspeare was a prominent member of this same company. The discovery of this most important fact is due to Mr. Halliwell, who found among the accounts of the Treasurer of the Chamber, the following memorandum:—"To William Kempe, William Shakspeare, and Richard Burbage, servauntes to the Lord Chamberleyne, upon the Councelles warrant, dated at Whitehall XVto. Marcii, 1594, for twoe severall comedies or enterludes, shewed by them before her Majestie in Christmas tyme laste paste, viz., upon St. Stephen's daye and Innocentes daye, xiij*li.* vis. viiid., and by waye of her Majesties rewarde vi*li.* xiijs. iiij*d.*, in all xx*li.*" Previously to the publication of this document, the earliest authentic notice of Shakspeare's connexion with the Lord Chamberlain's company was that which occurs in the list of actors who performed in Ben Jonson's comedy of "Every Man in his Humour," in 1598.

When the Globe was built, at the close of the sixteenth century, and the lease of Blackfriars was bought back by Cuthbert and Richard Burbage, the Lord Chamberlain's company made these theatres their head-quarters, and it was on the north and south banks of the Thames that most of Shakspeare's masterpieces first appeared; but it would not be fair to defraud the earlier theatres of their share in that association with the fame of the great poet, which makes sacred ground of the places he frequented.

The large mass of valuable information in the first part of the "Illustrations of the Life of Shakspeare" causes us to look forward with interest to the publication of more. The design of the work is stated by Mr. Halliwell himself to be "a critical investigation into the truth or purport of every recorded incident in the personal and literary history of Shakspeare." He proposes to add notices of the poet's "surroundings; that is to say, amongst others, of the members of his family, the persons with whom he associated, the books he used, the stage on which he acted, the estates he purchased, the houses and towns in which he resided, and the country through which he travelled."

When completed, this work will be a noble monument to Shakspeare, more honourable to his memory than any statue.

A MANUAL OF BRICKLAYING.

AMONG new numbers and new editions of Weale's Rudimentary Series, is a manual of practical bricklaying,* intended as a guide to beginners in the trade, or for those "who have not had the opportunity of seeing so much of the higher branches of work" as they might have wished. The writer has, as he tells us, intentionally used language as simple as the subject will allow, and terms well understood in the trade; the greater number of books on building construction being, as he considers, written in such terms that the majority of working men would find difficulty in understanding them without continual reference to a technical dictionary.

There is considerable truth in this, and the author of this manual is to be commended for his simple and concise way of giving his information, and for the directly practical nature of most of his remarks. The ordinary problems and difficulties of bricklayers' work are explained, from foundations and footings to cutting and gauging arches. Pointing, brick-paving, and tiling receive due attention. A chapter is given to the simpler problems of geometry and mensuration, which are likely to be of use to the working bricklayer; and a section on slaters' and plasterers' work is added, for the benefit of workers in out-of-the-way country districts, where this part of the work has sometimes to be undertaken by bricklayers.

While commending the general practical character of the treatise, we can hardly regard it, however, as leading to a proficiency in the higher branches of the trade; for it appears to us to be too much based upon established usages, some of which have nothing but usage to recommend them. Under the head of "bonding" we have the old article of faith, that though English bond is much the stronger, and is therefore used in all buildings "where strength is a principal object," the appearance "is not considered so neat as Flemish bond." Who does not consider it so neat? The bricklayers themselves, we suppose. The best brickwork in the brick-building countries of the Continent, where a degree of architectural effect is realised in brickwork such as never has been attempted in England, is entirely what is now called English bond, but which is no more English than the other; in fact, much less so. There is a great deal to say about matters and methods for colouring brickwork, so as to make it all uniform and "like one block"; and unless the prescriptions given are duly attended to, it will be impossible, we are told, to get the bricks all the same colour. Who wants them all the same colour? The varied tints of brickwork are just what relieve the surface and give tone to it, especially when old. Then there is much detailed advice about tuck-pointing, concerning the using of which the shortest and directest advice is "Don't." Our friend is a follower of the precedents of the English trade, again, about mortar joints, and the use of mortar generally. He calls attention, in good time, to the probable mischiefs of cement grouting in the centre of a wall; the result being, as cement swells and mortar shrinks, that the wall so constructed is likely, in the end, to have all the weight resting on its middle portions only. But in his advocacy of thin joints, he again ignores the fact that the best and most lasting brickwork that has been built, in Roman and Mediæval times, is all built with thick joints. He is of opinion that a thick mortar joint means extensive settlement. No doubt it does, if mortar is made thin and sloppy, and with mud instead of sand. The question is, in fact, between a dry brick and sloppy mortar, or a wet brick and stiff good mortar; which latter, again, we repeat, is what all the best (and the best and most effective looking) brickwork has been constructed with. If the mortar is what it should be, it has no business to give any more than the brick. That it very seldom is what it should be, is probable enough. In the mention of wood and hoop-iron bond, the author rightly condemns the former as a destructive agent in a wall, passively if not actively. But he should have added that the iron bond ought only to be regarded as a temporary expedient for additional security till the walls have fairly set and arches come to their bearing, &c. But the oddest instance of the prevalence of trade practice over common sense that we notice, occurs in the remarks on cutting and setting out arches. It is a pity, by the way, that the foolish use of the word "Gothic," to mean anything pointed, is kept up here; and a segmental pointed arch is described as "a reduced or modified Gothic." It is time intelligent workmen should be taught to use the nomenclature of styles in its true meaning, and not in this kind of shop phraseology. It is gratifying to see that the flat arch (called here the "camber arch") is described as the most difficult to cut and set; it would be still better if it were impossible. But our particular instance is in regard to the directions for setting out what the author calls a *semi-ellipsis* arch,—a three-centred one. The workman is directed here to fix the shape and bevel of the brick according to the radius of the larger (centre) curve, and then continue the same pattern of brick through the curves of smaller radius on the haunches of the arch, and then doctor the joints so as to make the bricks work in to the smaller radius. But it is considerately added, that "it is thought by some" that the moulds can be taken by drawing lines from equal divisions on the extrados to the respective centres; "but it is evident the bricks in the arch cannot be all of one size and shape if this is done, although there is little doubt the arch is stronger that way, owing to there being a better skew-back for the crown than there would be if each course were cut to one mould; it is unnecessary to say that this is the easiest method. But the appearance is not so good, *for*" (we like that "for") "it is an understood thing in the trade that all courses of an arch should be of one size."

Could there be a more delightful piece of stupidity? The one way is the strongest, it is the mathematically correct way, it is admitted to be the easiest way (the right way is generally the easiest, if people would only see it), but it is not to be employed, because it is "an understood thing in the trade" that it shall be done the wrong way; and (apparently) whatever is the understood practice in the trade must necessarily look best. It is fortunate the "inspired workman" has not got it all his own way yet.

Apart from such occasional lapses, the book will be useful to those to whom it is addressed, especially in regard to the practical geometry and mensuration chapters, and as a compendious memorandum of the usual practice in bricklayers' work. But it is certainly capable of being improved upon, without losing the simplicity and practical character which its author has rightly aimed at.

* "The Rudiments of Practical Bricklaying." By Adam Hammond. Illustrated with sixty-eight woodcuts. London: Lockwood & Co.

CHARING CROSS FLOATING SWIMMING-BATH.

JUST now, after long-prevailing easterly and north-easterly winds, often accompanied with cold rain, the thought of a plunge into a river is about as pleasantly inviting as the idea of "vinegar to the teeth and smoke to the eyes"; but the dog-days, the time of sweltering heat, and of drought, the time when a souse in cold water will be one of the most exquisite luxuries within reach, will come again, and it is well that preparation should be made for the coming of such time. The Floating Swimming-Baths Company have made a good beginning in the erection, fast approaching completion, of the first of a series of structures that will multiply as rapidly, it may be hoped, as the Board Schools, additions to which have to be so often recorded.

Passing, as the River Thames does at London, for miles between a dense population upon each bank, it ought to be a favourite bathing-stream. The two main reasons why it is not are obvious,—the demands of common decency, and the impure condition of the water. These considerations, however, are not bars to the irrepressible *gamins*, troops of whom may be seen gambolling *in puris naturalibus* on the edges of the Thames in July and August. The Floating Swimming-Baths Company are removing the bars to bathing in the Thames by providing pure water and privacy.

Their first structure, at the north end of

Charing-cross Railway bridge, will be completed about the beginning of the bathing season,—say the end of May or the beginning of June,—and will be, in addition to its uses, quite an ornament to the river. The substructure, which is entirely of iron, was built by the Thames Ironworks Company, and was floated from their works to the station it now occupies on the up-stream side of the viaduct. Buoyancy is obtained by two longitudinal bulk-headed box-girders, nearly 12 ft. deep, and about 2 ft. 6 in. wide. The framework of the bottom consists of kelsons and cross girders, to which iron plates are riveted under the entire surface, which is smooth. The ends are also bound and held together by transverse bracings. Above, the hull, so to say, is bound by two arched box-girders, so formed as to admit of an effective view from one end of the bath to the other.

The superstructure is being executed under contract by Messrs. Braid, Jopling, & Co., builders, of Vincent-square, whose work seems to be excellent in workmanship and materials alike. The structure is 177 ft. long and 30 ft. wide. The water area of the swimming-bath is 135 ft. by 25 ft. The depth will be 7 ft. 3 in. for 50 ft. at the west end, from which it will diminish by a uniform slope to 3 ft. at the east end. The floor of the bath will be of dressed 3-in. planking, fastened by brass screws to cross-bearers, resting upon iron standards fixed to the bottom of the hull. On the embankment side are two ranges of dressing-boxes, supported upon cantilevers, that project from the back of the main structure. Another range of dressing-boxes across one of the ends brings up the total number to about four dozen. In addition to these a large, well-lighted dressing-room is provided over the machinery-room at one end of the bath, and at the opposite end is a spacious refreshment-room with windows of polished plate glass from which a view of the river is commanded, but with blinds so adjusted as to prevent the view from being reciprocal from the river. There will be two approaches from the Embankment by swing bridges, that rise and fall with the tide, as the bath itself does under the control of guide-rods that keep it in position in the same wa asy the steam-boat stages are worked. At low water the bath will rest upon a gridiron, which will effectually obviate any strain upon the framework or shifting from its proper position. At present about eighty tons of iron ballast is used to steady the structure while the work is in progress. This will be removed when the water is let in.

The sky-line of the bath is broken by domed roofs near each end, with glazed crowns louvred and finished with ornamental metal finials. The central ridged portion of the roof is coved and depressed, below the domes; it has also broad belts of glass, louvred at the crown, and will be finished with a pierced ornamental metal cresting. The lower parts of the roof will be covered with zinc plaques. The principal front to the river is entirely of fluted glass, excepting, of course, the wrought-iron ribs and the sash-bars.

The bath will contain 100,000 gallons, and machinery is provided for supplying it with 500 gallons of fresh water per minute. The machinery-room, in the basement at the east end of the building, is furnished with a 14-horse power portable boiler, and two centrifugal pumps with 7-in. pipes, that are equal to the discharge of 300 gallons each per minute. Four large boilers project from the machinery-room, from which they will be stoked, into the bath, and by means of these the temperature of the water may be raised at pleasure, but it is not contemplated, we believe, to make the water at any time more than tepid; the degree of heat, however, is only a question of coal consumption, ample boiler-power being provided for any requirement. The floor of the bath over the boilers is of perforated iron plates. The water supply is to be taken from the river at or near high water. It will pass from the river into the large iron tank filters placed along each side of the machine-room. From the filter-cisterns the water will be pumped continuously into the bath, which is provided, of course, with outlet ports for the overflow. Efficient filtration is, it may be supposed, a matter of great importance, and has received due attention. After numerous experiments and prolonged trials, the conclusion has been arrived at that the system patented by Mr. E. Perrett, of Abingdon-street, will best meet the requirements. The process employed is to separate solid impurities by mechanical means. Charcoal is not required or used, but, whatever the medium may be, the desirable result is attained of producing water that, after treatment, is simply perfectly limpid.

The structure and its details have been designed by Mr. Perrett; Messrs. Braid & Co., as stated, are executing the iron and wood work, roofing, &c.; the machinery is supplied by Messrs. C. Powis & Co.; Mr. W. Smith is the clerk of the works.

The success of the company will necessarily depend very much upon their tariff, and the efficiency of their management. In the event of these proving satisfactory, there can be little doubt that a number of similar erections on both banks of the river, and upon an enlarged scale, will follow the pioneer bath at Charing Cross. We hear that some enthusiastic patrons of the art of natation are ready to use the bath as a swimming school, and to give lessons by competent teachers to certain classes of learners, free of charge.

THE WATER SUPPLY OF LIVERPOOL AND THE ERECTION OF NEW BATHS.

THE water supply of Liverpool is at present causing much anxiety, and forms a subject of grave discussion amongst the local authorities. There seems to be a considerable diversity of opinion in the Municipal Council as to the present sources of supply, one party inclining to the belief that the town is in danger of a water famine, whilst others contend that, owing to several millions of gallons of water having latterly been saved weekly, by the introduction of a new system by the water engineer for preventing waste, there was no necessity for any such apprehension. Amongst those who believe that a largely-increased supply, from entirely new sources, is absolutely necessary are the chairman and several members of the Water Committee, and it appears that an expenditure, amounting to between 2,000*l.* and 3,000*l.*, has already been incurred in the employment of Mr. Hawksley, C.E., Mr. J. F. Bateman, C.E., and Mr. Glaisher, for professional advice on the question of a new supply to the town. Mr. Bateman has reported in favour of two alternative schemes, both of which may be pronounced of a comprehensive, if not of a gigantic, character. In one of these schemes Mr. Bateman proposes to convey a supply from the river Wyre, with its tributaries the Brock and the Calder, yielding about 26,000,000 million gallons per day, at a cost of 2,141,000*l.* The sources of this supply are some fifty miles northwards of Liverpool, and the conduits and pipes would have to be carried along the route through Preston and the Lancashire towns. Mr. Bateman's other scheme is still more formidable, and it is this which he favours most. It is no less than a proposal to convey water to Liverpool from the Westmoreland lakes. Ullswater is the lake from which Mr. Bateman proposes to obtain a supply, which he says would be sufficient for both Liverpool and Manchester. One tunnel would be required eight and a half miles long, and the cost to Liverpool would be 2,421,000*l.* The distance of Ullswater from Liverpool is about eighty miles.

The subject came on for discussion at a meeting of the Town Council last week, when Mr. Samuelson, one of the members, said he thought it was quite time the Chairman of the Water Committee should pledge himself to bring before the Council the question of supply of water to the town. The urgency of the requirement of a further supply of water to Liverpool was apparent to every one. He candidly confessed that he had no faith in the statements which had been made as to the saving of water, and urged that if they had a good supply of water, they were, upon sanitary grounds alone, bound to give it to the public. He desired the Chairman of the Water Committee to let the Council know what was really meant to be done. Mr. Beloe, on the other hand, said he was not one who shared in the alarm felt as to a threatened scarcity of water, although he was willing to consider any scheme, at a reasonable cost, which would provide the fullest supply of water possible. Mr. Wilson, chairman of the Water Committee, in this conflict of opinion, observed that he had expressed a wish for a special meeting to be called on the subject during the present month. The supply of water to the town was at the present moment of great importance. The committee were not, however, yet quite prepared with their scheme, but hoped shortly to be in that position, when a special meeting would be called.

Almost immediately immediately afterwards Mr. Wilson rather startled the Council with a statement closely bearing on the subject. The Baths Committee recommended the acceptance of the tender of Messrs. W. Thornton & Sons, at 13,100*l.* for the erection of new baths in Kirkdale, on which Mr. Wilson expressed his belief that with the great demand upon them for the supply of water, which he feared they had no chance of meeting, the supply of water to these baths would have to be refused.

REGENT'S PARK EXPLOSION AND MACCLESFIELD GATE.

No event of our time has caused greater sensation than the fortuitous incident which exploded a barge laden with gunpowder on the Regent's Canal,—for a range of half a mile from Portland-terrace to Gloucester Gate, whole terraces of houses had the roofs injured and the windows blown in; and within 250 yards' distance, several houses were shattered and rendered uninhabitable. As a matter of course, meetings were held to redress the calamity, and to help the sufferers, to whom insurance offices lent no aid; and a large fund, somewhere about 8,000*l.*, was subscribed; but that sum was utterly inadequate to effect structural repairs, which would require at least four times that amount, six large houses in the immediate vicinage having been wholly shattered, and damage to the extent of 20 per cent. on the value having befallen at least twenty more; but, in point of fact, the amount subscribed was distributed amongst the poor lodger classes, who had been disturbed in their scattered tenements, some having been forced to change location, or having had movables somewhat damaged by the explosion; amongst such, nearly the whole fund was distributed by the Committee Board in benevolences.

As to assistance given to the owners of house property, one example may suffice,—having had one large mansion, and two smaller houses shaken, almost to ruin, the proprietor appealed to the Board for aid in restoring the two smaller houses. His appeal was answered by donations of 10*l.* first, and then of 20*l.*; whereas the cost of repairs to make the two houses barely habitable amounted to over 100*l.*

As to the owners and occupiers of large mansions, no aid has been extended to them by the Committee, although public sympathy was certainly excited to subscribe by the wreck and ruin so palpably inflicted upon the unlucky vicinal proprietors.

There is, however, a wreck and ruin of great public importance which, after a lapse of six months, still remains to be redressed. Macclesfield Gate Bridge, the only carriage-entrance to the park for at least a mile and a half (between Gloucester Gate, N., and Hanover Gate, W.), has, together with the gate-lodge, been wholly demolished. The iron pillars and *débris* of the bridge are laid on the canal brink, leaving only room for the horse towing-path; but the occupants of the vicinage and public are wholly debarred from direct access to this beautiful park-drive.

The Avenue-road, Primrose-hill terrace and road, and the north-western limits of Portland-town, are seriously damaged by the prohibition. To whom are the inhabitants or the general public to look for restitution?

If Regent's Park be public property, surely there ought to be some governing body, or ranger, or manager, to repair damages, whether accidental or wanton. When Hyde Park railings were pulled down by an infuriated mob, the Royal Ranger had the damages very soon repaired, although there was in that instance no obstruction of public thoroughfare. Why, then, should the most beautiful drive of Regent's Park be so long shut off from public access?

QUONDAM.

Columbia Market.—On the 6th inst., in the House of Commons, the case of the Columbia Market Bill came on as an unopposed measure for confirming the re-transfer of Columbia Market by the mayor, commoners, and citizens of the City of London to the Baroness Burdett Coutts, and for making further provisions respecting the maintenance and use of the market. The preamble of the Bill was declared proved, and it passed through Committee. It is understood that the market will be converted into dwellings for the working classes.

THE NATIONAL GALLERY.

Most of our readers have seen reports of the discussion on the subject of the National Gallery, which was raised by Mr. Beresford Hope, in the House of Commons on Friday, the 9th inst.

The hon. member for the University of Cambridge put the case very clearly before the public, and it is to be hoped that the question may soon be solved in the only rational manner by the erection of the new building so long promised. Lord Henry Lennox as First Commissioner of Works was of course bound not to commit the Government hastily, but was obliged to say that "when matters came to the worst, they were likely to mend, and certainly, nothing could be worse than the present façade of the National Gallery."

As regards its internal accommodation, the case is little better than with the façade; for Mr. Hope pointed out that whereas the trustees of the national Gallery had asked for 4,200 linear feet of hanging space, the present gallery, even when timbered, and with the new additions reckoned in, will only provide little more than 3,000 ft., or less than three-fourths of the space now wanted, without allowing for future requirements. Moreover this allowance of 3,000 ft. can only be made up by close packing, and by reckoning in every corner of the present galleries, some of which are badly lighted, and very unsatisfactory.

It was further stated in the debate that every internal architectural feature of the present building, had already been ruthlessly sacrificed to obtain space, so that the entrance and staircase which were originally handsome, are now quite unworthy of a public building. Now why should the public submit to such a state of things? Is England with her millions upon millions, so poor that she cannot afford a small per centage of her national wealth for the interests of art? At private sales there is no sign of diminished anxiety to possess masterpieces. Why are the national aspirations in this direction to be ignored and starved?

It may be right to build Palaces of Justice, and Government Offices as grand as palaces, from which the public is excluded; but this is no reason for neglecting the National Gallery, which is in an especial manner a public building, to which the poorest has a right to resort for innocent and instructive recreation.

We are convinced that the Government would not only do a wise but a popular thing, if they showed a determination to endow the nation with all that is ennobling and refining in their national collections. The rich can be trusted to provide these delights for themselves, but the Government is trustee for the whole people, and is bound to consider their interests. It seems that the site is already purchased, and the large sum of 140,000*l.* paid for it. The cost of a new building would, of course, be spread over several years, and would therefore form no heavy burden in the budget. Too much or too little has obviously been done, and it is not creditable to the Government that they should formally instruct their architect to proceed, and then keep him for years without replies to his communications. It is the more remarkable that this should be the case, as the authorities appear to be well contented with that portion of the new building which has been completed. Mr. Hope stated that he was "delighted with the new galleries," and the First Commissioner of Works not only endorsed this opinion but went further, and declared the work, as far as it had gone, to be a "magnificent success."

Mr. Beresford Hope very properly put his question on public grounds alone, stating that he was not counsel for Mr. Barry or any private individual, but we do not think any member of the architectural profession will agree with Lord Henry Lennox if he means to contend that Mr. Barry has no reason to be discontented with the treatment he has received at the hands of his lordship's predecessors.

We are not in Mr. Hope's position. We *are* counsel for Mr. Barry. We hold a standing brief for every member of the profession not fairly dealt with, and at the time of the competitions for the New Law Courts and the National Gallery, it became our duty to point out that injustice was committed. The judges, in the case of the Law Courts, reported, as is well known, in favour of Mr. Barry and Mr. Street as joint architects, placing Mr. Barry's name first in their report. The conditions of competition provided that the decision of the judges should be "final."

Notwithstanding this absolute obligation, which they had voluntarily incurred, the Government set aside the "final" decision of their own judges, to Mr. Barry's prejudice, while they have retained his designs, and, as he has since stated publicly, have never even had the courtesy to answer his inquiries, or give him any explanation on the subject.

It now appears that in the case of the National Gallery a similar policy of silence has been observed. The Government first declared that they would respect the report of the judges of this competition, which in this case, as Mr. Hope (who was one of them, states) indicated Mr. Barry as the winner in the competition, and the architect to be employed. They formally appointed him, in 1868, architect of the "New National Gallery," they directed him to prepare plans, to make arrangements for proceeding at once with the work, and then they have kept him waiting year after year in a state of uncertainty, which still continues.

We think few of our readers who are aware of all that has passed on this subject will feel surprised that Mr. Barry should, under the circumstances, have told Lord H. Lennox, as the latter implied, that he felt he had been ill-treated; and we are confident he has the sympathies of the profession at large. It seems to us that every member of the latter, and especially every one who entered the competitions, has a claim to remonstrate, if the promises made to induce architects to furnish designs for public works are not carried out with scrupulous care and justice. It is impossible to contend that this has been the case with the two competitions referred to, and in our opinion, as we have before now stated, Mr. Barry has a good right to complain.

HER MAJESTY'S TOWER, IN THE DAYS OF QUEEN ELIZABETH.

There can, we think, be little doubt, judging from appearances, that the Tower,—"Her Majesty's Tower," as the officials love to call it,—will now attract no small share of public attention, certainly of those who are termed the "sight-seeing" public. We have already made some note of it, and of its *present* state and condition; this condition and present state of existence being, it is grievous to think, but a mere ghost and skeleton of what it once upon a time was, say in the days of good Queen Bess, to say nothing of still earlier epochs. We propose now, therefore, and it may interest many, to give as far as is possible some idea of her Majesty's Tower as it existed in the days of Queen Elizabeth, and at a time before the quaintness,—we hardly know a better term,—of *costume*, and all other accessories of daily life, had vanished, and when there still remained preserved a quite English artistic harmony between the several items of British life and daily existence. It will be found a good and characteristic day to revert to, and will show the Tower of London in a very fair state of integrity.

It must not be, however, imagined that this famous Tower has not a far older history. Quite the reverse; for Mr. Hepworth Dixon, who has done so much to unravel its mysteries and strange histories, contends strenuously that even as to "length of days" the Tower of London has "no rival," even among palaces and prisons; the origin of it, as he maintains, being like that of the "Iliad and the Sphinx,"—lost in the nebulous ages, and in times long, very long, before our definite history took shape. Old writers date it from the days of Cæsar,—a legend taken up by Shakspeare; indeed, the name of Cæsar's Tower remains in popular use to this very day. A Roman wall can even yet be traced near to some parts of the ditch, and certainly some of the existing wall masonry tells of Roman wall building "precedent." It is mentioned, too, in the Saxon Chronicle. A Saxon stronghold may indeed have existed on this very spot whereon the Tower now stands. But the main and central building, as we before said, the White Tower, was commenced by William the Norman, and the series of apartments, in Cæsar's Tower, were certainly built in the early Norman reigns, and actually made use of as a royal residence by our Norman kings. What, then, says Mr. Dixon enthusiastically, can Europe show to compare against such a tale? Why most surely nothing. Set against the Tower of London, with its eight hundred years of historic life, its nineteen hundred years of traditional fame, all other palaces and prisons,—for it must not be forgotten that it was both the one and the other,—appear like things of an hour! Very, very true, and what a thousand pities it then is that we cannot indeed see all this "antiquity"—or, at any rate, the remains of it. But, alas! there is but a mere ghost of it all left. Let us see how much of it, by reference to Queen Elizabeth's Tower.

But first it may be interesting to note a few of the olden things of Continental fame and antiquity. The oldest bit of palace in Europe would seem to be that of the Burg in Vienna, date of Henry III.; the famous Kremlin, Moscow; the Doge's Palace, Venice, are of the fourteenth century. The Seraglio, Stamboul, was built by Mahomet II. Next, the oldest part of the Vatican commenced by Borgia, whose name it bears. Then the old Louvre, commenced in the reign of Henry VIII.; the Tuileries, in that of Elizabeth. The Spanish Escorial belongs to the seventeenth century; while such palaces as those of Athens, Cairo, and the Persian Teheran, are all of them of quite modern date; so that it is no idle boast, the hoar antiquity of the London Tower Palace. Then, again, as to the "prisons," none of them, with the single exception of St. Angelo, Rome, can compare with the Tower Prison. The never-to-be-forgotten Bastile, of which, by the way, there are some curious records on paper, is a thing of the past, as all know. The Bargello is a museum. The Piombi, of poetic fame, are removed from beneath the Doge's roof. Vincennes, Spandau, Spilberg, Magdeburg, are all *modern* compared with it. Again, we wish we could see this old Tower of London, and compare things.

In the days of Elizabeth there stood of course, as fortunately there yet does stand, so that we can yet see it, that central feature of the whole mass of buildings, the original Norman "Keep," or White Tower, pretty much as it was, but, as we have said, so filled with piles of "small arms" as in a warehouse, that you can hardly tell where you are, or what the building is, or was, that you find yourself in. But there it is, and it is a something left to tell its own tale as best it can. This White Tower is in the inner ward, and this inner ward held, once on a time, in the days of Queen Bess, not a few other things, and buildings, all right full of romantic interest. It is as vain to look for them as it would be to search for the "Queen's Apartments," or the "Queen's Garden," so utterly bare is the place, as compared with its state in Elizabeth's day, when you might have gone the round of the old Tower, and read its history on its walls, in its many rooms, its gloomy towers, and indeed in the very ground on which it all stood. We can but give the *names*, and they are a something, of what once was, of the Wardrobe Tower; the Cold Harbour, *i.e.*, other towers connected with it; St. Peter's Church, now existing; the "Block"; officers' houses; the two *Gardens;* the Lieutenant's house; and the gunners' quarters, all right full, by the way (and this is not to be forgotten), of quaint details, and Gothic methods of house-building and tower-building, and of common mason's work.

Next would come in proper order the towers and other structures on the wall; but before we come to these, it may be useful to note that there was a clear way by the river side all along the water front of the Tower, the water filling the moat all round it, this moat being supplied through or under the St. Thomas's Tower, or rather group of four towers, with connecting walls. The "Traitor's Gate," with portcullis and low archway under the roadway, and immediately opposite the world-famous Bloody Tower, with another dark archway and another portcullis. These are, dismal to say, utterly gone,—towers, gateways, and all. Why was this? The modern substitutes for a small part of them is new work, and fails to touch, as old time-coloured work always does, the "chord of romance" in man's heart.

The moat on the river side ran parallel with the river, and it was over it that the St. Thomas's Tower was built. The Byeward Tower, still fortunately remaining, was to the west of this, and on the inner side of the moat, with again the Middle tower or towers, and with the postern as main entrance to the whole pile of buildings, and approached from what is now Tower-street. A more thoroughly "Gothic way" could not be, and if the element of the picturesque be a first necessity in building, then indeed we can hardly sufficiently estimate the extent of our losses, and must needs envy those who in Queen Bess's day were privileged to *see all* the old work. To the east of this was the Cradle Tower, the Well Tower, and the Iron Gate,

forming another main entrance with portcullis, to the whole group of buildings within the outer wall and moat. We can here readily imagine with what gloomy thoughts and dismal forebodings, the unhappy State prisoner, whoever he might be, must have passed under and by the side of these gloomy archways and towers, and how small must have been his hope of any possibility of escape. Quite a romance this little stretch of water-way. Gundulf, the "Weeper," who built the White Tower, must have been indeed a prophet, and laid the foundations of his tower "in tears," for they, as we are told welled forth from what seemed to be an unfailing source; and it is quite sure that those who followed him and entered his "Tower," had full cause to weep when they caught glimpse of his work. Gundulf, be it observed in passing, rebuilt Rochester Cathedral, and maybe its Castle, not a little like to his "keep" in London. He also built the first St. Peter's Church, and the old Barbican, known as the Hall Tower, next to the Bloody Tower, and close to the Great Hall.

The outer wall washed by the moat had also flanking towers, the Brass Mount, and Legge Mount, the Galleyman Tower, the Lantern Tower, and the "Bell" Tower, with belfry, still we are rejoiced to say, remaining *intact*, so that in it may yet be seen, as in the White Tower itself, a specimen of the old walling, and system of tower building and construction. It may be noted here that Windsor Castle had, and has, its Bell Tower, and that it is all but the *sole remnant* of that notable castle as it once existed, nearly the whole of the rest of it being of *modern* castle-building date. If any very curious student wants to know what sort of charm there really does lie in "old walling," as contrasted with modern rubble work, why here in these Bell Towers it may be seen. Notable and artistic work it is, though it seems so simple! Green fields, by the way, surrounded the Tower Moat in Queen Elizabeth's day, and but a few scattered old houses here and there could be seen till you got inside the outer ballium.

We have said that the keep, or White Tower, occupied the centre of the whole pile within the moat, or ditch. But, surrounding this central tower, was the *Inner Ward Wall* and its towers, whose very *names* are right full of history and romance; and, we must needs add, of weeping and wailing memories. The Bell Tower, as above, and next to it the Beauchamp Tower, the Develin Tower, the Flint Tower, the Bowyer Tower, the Brick Tower, the Martin Tower, the Constable Tower, the Broad Arrow Tower, and at the angle the Salt Tower. These, with their connecting walls or battlements, with a way all round, and with passages or archways through the towers which rose above all, once on a time, had a veritable existence. A very powerful imagination indeed on the spot is needed to *realise* all this. We have thought it a something to record and print the hollow names!—better than nothing, surely. Well might we say with the immortal bard,—

> "A 'somebody' of the Tower hath buried them;
> But *where*, to say the truth, we do not know!"

There were two rows of quaint Gothic-built houses, and even single houses, scattered over the ground, regardless of order, with quarters for the soldiers; all, in short, making up together a *little town*,—quite a museum, had it been kept, of Middle Age antiquities, and which would have—did it but exist as in the days of Queen Bess—taken us bodily, as well as mentally, into London of the Past,—at least, as far as the more material buildings and ground could do it. We could not, certainly, see everything just as in past days; to wit, a royal barge with a queen on board, in all "bravery of gold and pennons"; nor a lieutenant's boat returning with a culprit in the stem of it, and with what might have been a "headsman" standing at his side, holding in hand the fatal axe. Not quite this, surely; but the *walls* of the place, high and thick and strong, and towers, with narrow prison windows, and narrow picturesque way between them,—more especially that between the inner and outer wards on the river-side, and between Traitor's Gate and the Bloody Tower,—could hardly have been surpassed for quaint and architecturesque and historic power. The inner and the outer wards of London's Tower are right notable in England's history. What a pity it is that so much of them have, for good and all, vanished utterly, leaving only *words* and *names* behind! Quite needless, too, all this fell destruction, for the whole place now is but little better than a big "storehouse," though once on a time, a Royal Palace!

Can nothing be done to bring it back?

A CITY OF THE FUTURE.*

LETTERS FROM SHAKSPEARIA BY SCAMOZZI SMITH, ESQ., ARCHITECT.

Written to his Friends in London during the Summer and Autumn of 1915-16.

MY DEAR ——,—The next day being Sunday, I was taken by my host to the great Church of St. John, his chief work of which I gave you a description some time ago, and must say that never was I so much impressed with religious service before as I was on this occasion, which I cannot help attributing, in some considerable degree, to its very appropriate artistic accompaniments, which seemed, not only to have the power of striking the senses and filling the imagination, but of touching the heart. There was that in the aspect of the place itself, to which the three sister arts of painting, sculpture, and architecture had combined to give a solemn beauty, that predisposed the mind to devout templation, and gave freedom and elevation to the soul. The architecture, broad and simple, admitting the flood of day from the centre of the fretted dome in one pure stream, like heavenly illumination, and which was its only avenue, save where it fitly streamed through the forms of glorified apostles in the altar window. The statues of saints and martyrs, those of whom the world was not worthy; and the grand picture above the altar, of Christ pronouncing the beatitudes on the Mount,—the great temple so adorned, perishable though it be, and the work of a creature whose breath is in his nostrils, seemed instinct with a spiritual power,—a power to raise the thoughts above earthly interests, and, at least, to assist faith in laying hold on the future life. But when the grand organ lifted up its voice, and a vast and devout congregation rose *en masse*, and, like the heavenly host in the Apocalypse, "sang hallelujah as the sound of seas"; when the rich music married to the immortal verse of the sweet psalmist of Israel rolled upon the ear, and resounded through the sculptured and painted dome and arches of the church, and, I may add, waking echoes in the deep mysteries of the heart, then it seemed as if the five divine sisters had become vocal, and united with man in the worship of the Eternal,—that worship in which I believe they all originally had their birth, — then, in the language of an eloquent advocate of the Mediæval architecture, the whole resounded and spoke like God from the clouds, from its lofty dome and vaults, or alternately sorrowed and rejoiced like man in the deep-swelling organ.

Yet all this, we must remember, is breathed from the human soul, Poetry, Painting, Sculpture, Music, and Architecture in her fine-art manifestations being the voice of the human heart; so that it is really humanity calling unto humanity with a voice divine.

It is a voice, however, if not difficult to understand, yet at least difficult to describe. Who, says Carlisle, can describe in logical language the effect that music has on us? If one is so difficult to describe, how much more must the combined voice of the four syren sisters? All we can say is, that—

> "Within the spells
> Of their beauty's power
> Something dimly dwells
> At variance with a world
> Of sorrows and farewells."

The sermon was in harmony with all this: it was at once eminently theological and philosophical, for there is no hostility exerted or felt here by the church against the philosopher, that highest faith having become prevalent expressed in the exclamation of the Emperor M. Aurelius, that nobody was ever injured by the truth, nor ever will be; that the truth, whatever it may be, can only lead to good,—can only lead to God, and the promotion of his glory; and that no doctrine of Christianity really dear to the hopes of man, or essential to his true dignity and happiness, will ever be discredited or undermined. It further reminded me of the writings of the amiable English divine, Cudworth; for, like them, it placed religion mainly in purity of heart, and love to God and man, and denounced all those as worse than atheists, and the worst enemies of their species, who propagated unworthy views of the character and conduct of the Creator, or the fundamental nature of man. The moral heroism which springs from such views seemed to inspire the preacher in his closing appeal. He strove,—

> "Against the torrent and the stubborn hill
> To urge free virtue's steps, and to her side
> Summon that strong divinity of soul
> Which conquers chance and fate."

Our conversation as we withdrew naturally turned on the relations of art and religion, a subject on which I was desirous of drawing out my companion. I alluded to the dogma of a writer of the last century, Ruskin, that art in the Middle Ages existed for moral teaching, and that when she gave up that task to her photetic kinswoman, Literature, she declined in power. He remarked that if she had so declined it could not be because she had relinquished the lower task of instructing the ignorant in sacred history and biography, in doing which, that is, in making stone Bibles of the cathedrals, she had well-nigh smothered the art of architecture, disfiguring it with hobgoblins and creatures of a disordered imagination, and a superstitious creed. It must have been from some other cause. Now, at all events, he believed that art by being true to her own laws, or, in other words, the three sister arts, by working in harmony, as he had endeavoured to make them work in the church we had just left, and by means of beauty, now their chief object, and allied with a purer religion, they would have far greater power over the hearts of men than they could otherwise have had; and that if art had abdicated the office of teaching the ignorant the truths of Scripture story, she had assumed a higher office of moral and spiritual inspirer to all, and had become the auxiliary, or rather an instrument, of the divine spirit itself, the consoler and elevator of men.

This house is situated in a retired suburb, the beauty of which has attracted many men of taste to the spot, who have greatly increased its beauty by the fine compositions and grouping, and harmonious colouring of the buildings they have introduced into, and engrafted on, the landscape. My visit gave me an opportunity of viewing several of these in company with mine host, who was as delighted as myself in hovering about every creation of the architectural muse possessing any great merit or originality. I have no time to make notes, or aught but very brief notes of these. But I will in some future letter endeavour to recall my impressions of their exteriors. Of the interiors, I could get but little information.

On the following morning, mine host, seeing the delight I took in everything architectural in the house and neighbourhood, and rightly divining that he could not give me a greater pleasure, proposed that we should make together an architectural excursion about the suburbs and through the city, where he said he could show me some things which, the place being large, had probably escaped my observation before, including one of his principal churches, and a very noble theatre, and other recently-constructed edifices. I of course gladly assented, and we sallied forth on a circuitous path for the city, on our way examining a great number of churches, which we were enabled to do without running after the sexton, as they are always open. They display, as a class, along with perfect fitness, great variety of internal arrangement and great ingenuity and knowledge of existing works and styles, which have been largely drawn upon. They are of all shapes of plan,—octagonal, hexagonal, square, oblong, round, semicircular, semi-octagonal, elliptical, and as various in their vertical sections. The dome-crowned Greek cross is, however, the typical form of a large class, and splendid are the variations on this general type, with central dome and four subordinate ones, all more or less satisfactory. Sometimes the central dome is lofty and the rest low; sometimes it predominates, chiefly in diameter. Here it is round and the others octagonal; there it is lofty and ogeed; while the rest are low and segmental. There are a few instances of central hemispherical dome surrounded by octagonal semidomes. As to the interior, with a great variety in design, detail, and decoration, there is great uniformity in the plan and disposal of the seats. I allude to Protestant churches, most of which have their seats ranged amphitheatrically, *i. e.*, concentrically, rising *gradatim* one above another. In one interior I recognised a striking similarity to St. Stephen's, Walbrook, of which, indeed, it is an idealisation.

External compositions are generally more or

* See p. 327, *ante*, with letter from Mr. S. Huggins.

less pyramidal, with one commanding feature in the centre. The dome appears both in Gothic and Classic, of various sections. Yet the spire plays a noble part in the aërial architecture of Shakspearia, but it rises as often from a lantern as otherwise, and *central* spires generally so rise. But the central crowning compositions exist in such variety that I despair of giving you any idea of them. Some are so light and aërial, you would wonder the first puff of wind does not blow them away like a vapour. They seem as if designed to give literally to airy nothing a local habitation and a name.

Generally, through the exquisite feeling for form, the outline of the buildings is so beautiful that if you can only get this outline projected against a lighter or darker background, you have sufficient to charm you, though you see nothing else. Generally, however, there are the charms of colouring and gilding, which latter, as you might naturally expect in a country which, being wounded, bleeds gold, is much used, showing itself chiefly on domes, and their terminals, groups of statues, which, often being the crowning of white marble towers or rotundas, have a glorious effect. Light being often brought from above, in public buildings, windows are often omitted, which gives rise to much ingenuity in relieving and embellishing walls externally and internally, — niches and statues or groups; niches, with square grounds and high-relief sculptured subjects; bas-reliefs; panels, with inscriptions; sculptured symbols; niches and statues in upper stories; in lower, niches, with bas-reliefs and inscriptions.

After this I need not say there is no imitation, as there is amongst us of the imperfect unfinished compositions of the Middle Ages; such as two equal west towers or spires without a pre-eminent central one to unite them. Nor have I yet seen three similar spires as at Lichfield, which is considered monotonous. When three spires are introduced, the central one, or each of the western ones, rises from a lantern. What is more important, all are true works of art, original in the right sense of the word, and what every true work of art must be, a thing that, as a whole, never was seen in the world before, and which never to the end of time will be seen again. Let me here mention that several small suburban Gothic churches we passed had very rich traceried windows, executed of timber.

On arriving at the theatre mentioned, I was gratified to find that it was one I had noticed before, and to which, it being near my hotel, I had made several early morning, I may say ante-breakfast, visits, which I was fain to do for its soothing and harmonising influence on my mind through the day. Of this I shall send you a sketch and some account by-and-by.

Close by this building is the School of Naval Architecture, an edifice which pleased me much, and the more on learning that the quality chiefly taught in it in reference to the form of vessels, is safety to life and property, not speed, so insanely and wickedly preferred amongst us. Opposite this is the Public Library of Shakspearia, and beyond it to the south the Public Museum, both fine buildings. They differ from ours in that they are not entirely free, but on the principle of our postage system charge 1d. for admission, by which they are almost self-supporting. I know not with what other result. Not far from these is a building remarkable for the profusion of sculptured representation of the brute kingdom of nature. It is the office of the Society for the Prevention of Cruelty to Animals, which is in a very flourishing condition here. It has obtained the prohibition of steeple-chases, horse-racing, hunting, and fishing as sports, all practices causing suffering to animals. As to hunting and shooting, I believe scarcely a man, certainly not a woman, could now be found who would join in such exercises.—Yours, &c.

Scamozzi Smith.

My Dear ——,—The next building we visited is the large and excellently planned and ventilated and designed infirmary of the city,—where, so numerous are the lady volunteer nurses who employ themselves in its management and visitation, that, with the slightest possible sacrifice of time on the part of each lady, the patients are seldom left even for an hour, to the mercy of hirelings; and the result, as regards the proportion of cures, is what might be expected.

A fine healthily-situated building was pointed out to me as the Asylum of that unfortunate class who have knowledge at one entrance quite shut out, and are consigned to that "death in life," blindness—the deprivation of that master sense through which the glory and beauty of the universe stream in upon the soul. It is felt that these have a peculiar claim on our sympathies and compassionate regard, and they are very carefully looked after here, and never pent up in close towns. This asylum is in a situation where, as if to compensate as much as possible for loss of the pleasures of sight, every other sense may be regaled, by pure air, garden perfumes, and Nature's sweet sounds and harmonies.

As we returned from our visit we were charmed by the beauty of a building that was pointed out to us delightfully situated outside the city. It is the asylum of the greatly maimed, mutilated, and deformed in body—a place rich in Flora's choicest gifts and attractions, natural and artificial, supposed sufficient to win, for the good of the public and preservation of its beauty, from a vagrant life, the greatest lover of liberty of that unfortunate class to its soft retreat; an object greatly aided by strict legislative enactments against mendicity—as unnecessary.

To the Lunatic asylum none can be consigned till it is considered needful by four-fifths of the College of Physicians and Surgeons.

One of the most beautiful buildings shown to me is the seat of the Royal Philological College or Academy, the chief province of which is, to watch over the growth, correct the defects, guard the purity, and increase the copiousness, superiority, and beauty of the English language. Of this more anon.

Adjoining it is the Royal Printing House, which has many very original features, which it well deserves, for it has adorned the republic of letters with such beautiful editions of standard works that it is supposed the Aldines and Elzeviers will be no more heard of.*

In all these buildings, whether halls, theatres, colleges, and in the churches, I noticed that the entrance-doors, which must always be the chief feature in architecture, were very fine features, highly decorated, and broad and lofty in proportions, and whatever the style, the deep reveals have rich columnar decorations. But this is characteristic of Shakspearian architecture, which is never demeaned in character and expression by low, narrow, and insignificant doors, such as too often disfigure ours, and of which the three mouse-holes at the north end of St. George's Hall, Liverpool, through which the judges of the land pass to the judgment-seat, are a notable example.

Another noticeable feature is the treatment of the frieze, which when plain and not charged with the life-giving ornament, as the Greeks called it (Cockerell, *Builder*, xii., 457) is otherwise marked by dark-coloured marble, red, purple, or blue granite. When it is charged with sculpture even the ground is sometimes a dark-coloured marble, which strongly relieves the light sculpture. It is always of first-rate quality, and so are the statues, which when in high situations, where high-class finish would be lost they get modelled in miniature by a first-rate sculptor in clay which bold carvers execute in large.

In the interior I noticed that the floors are more simply treated than in England, where our richly-coloured and glazed tiles are peculiarly absurd in a climate or country where it is not the custom to take off the shoes on entering any place, however sacred. Besides these I was shown the Architectural Museum of Models or Restorations of all the great buildings and monuments of the world; the Geological Gallery, containing models of the structure and crust of the earth, showing the various deposits; the Astronomical Museum, exhibiting models on a grand scale of the glorious machinery of the Universe; the Hall of Moral and Metaphysical Science, &c.,—all worthy of their high and ennobling purposes.

Some of the buildings seen, which, by the way, are all completely fireproof, were chiefly remarkable for the beauty of their composition and form; others for the delicacy of their details; a third set for the amazing interest and variety of their carved decorations, in some of which the cunning interweaving of the human with the animal form, birds, beasts, fishes, reptiles, and plants of all kinds, is beyond all praise of mine.

Our next object was the great Church of St. Thomas, which we thoroughly examined. But of which I postpone my description.

* Printing, from its connexion with literature, is regarded as a Fine Art, and printers unite usually mechanical ingenuity and artistic taste with considerable erudition, chiefly philological. Typographical correctness is a matter of course, and is fully expected both by authors and the public.

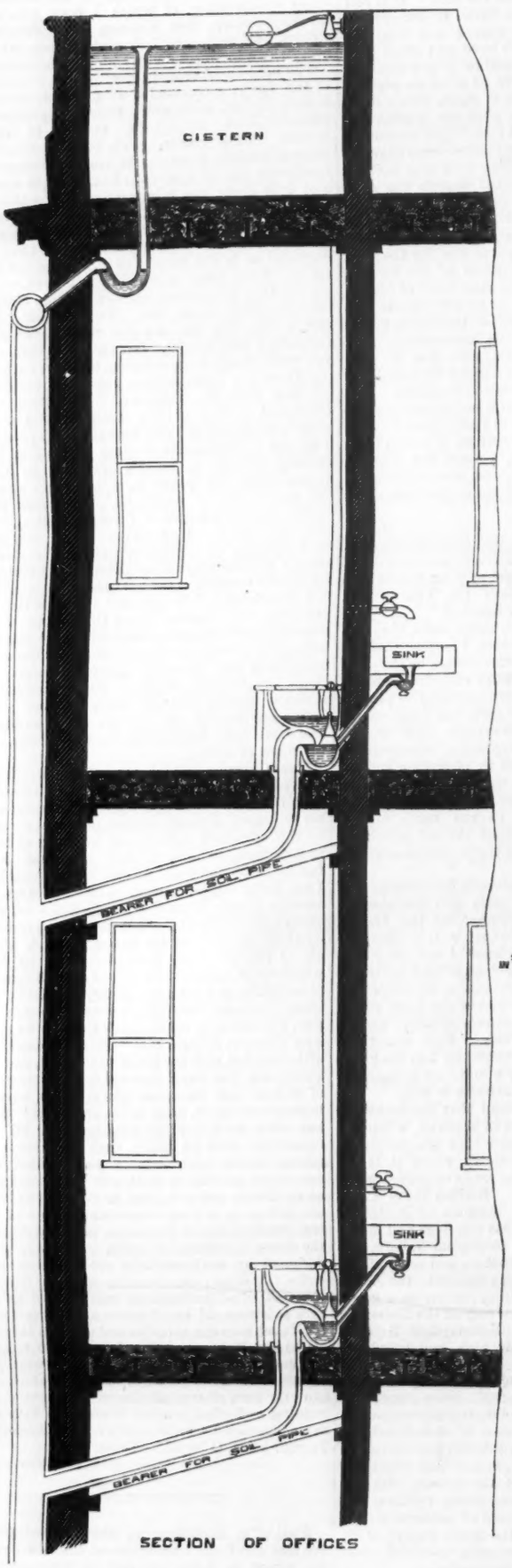
On leaving this church we gave our attention more particularly to the effect of the ordinary street architecture, of which I must give you my impressions, first noticing those detached objects, half sculpture half architecture, which everywhere intersect and terminate the vistas.

The light aërial architectural objects, creatures of the fancy, compounded of columns, arches, domes, niches, pediments, canopies, groups of peace-trophies, bas-reliefs, statues of men, women, muses, graces, genii, birds, beasts, the most interesting creations of the sculptor, combined with the most elegant forms of the architect that grace the intersections of the streets and centres of squares, octagons, quadrants, crescents, circuses, everywhere would astonish and enchant you: all for some use, and yet as beautiful as if for beauty only. Some are for shelter from sun, some are fountains, — all protect from flying vehicles,—all contain clocks, thermometers, vanes, &c. The objects that spring into the air are the most aërial and romantic I ever beheld. Seen at some distance, you would fancy them columns of vapour exhaling from the earth, rather than solid masonry pressing upon it. Compared with these, the triumphal arches of the Romans, and their modern imitations in Paris, look tame and prosaic. They are embodiments of ideas such as, in our country, wrought in fancy's loom, float in light visions round the poet's head, but never round the architect's or sculptor's. Nor must you suppose by my mention of domes, columns, &c., that they are all in the Classic style; they are as frequently of Gothic, where the unglazed tracery window plays a beautiful part in pierced work, and sometimes the buttress appears. But it is so refined and brightened in shape that it has more of a Classic than a Gothic air. It is generally semi-octagon, diminishing as it ascends from great massive strength below, into the most marvellous and fantastic lightness above. In these the masonic feats in the production of skeleton domes, pierced lanterns, and open spires are beyond my powers of description. The earth hath bubbles as the water hath, and these are of them.

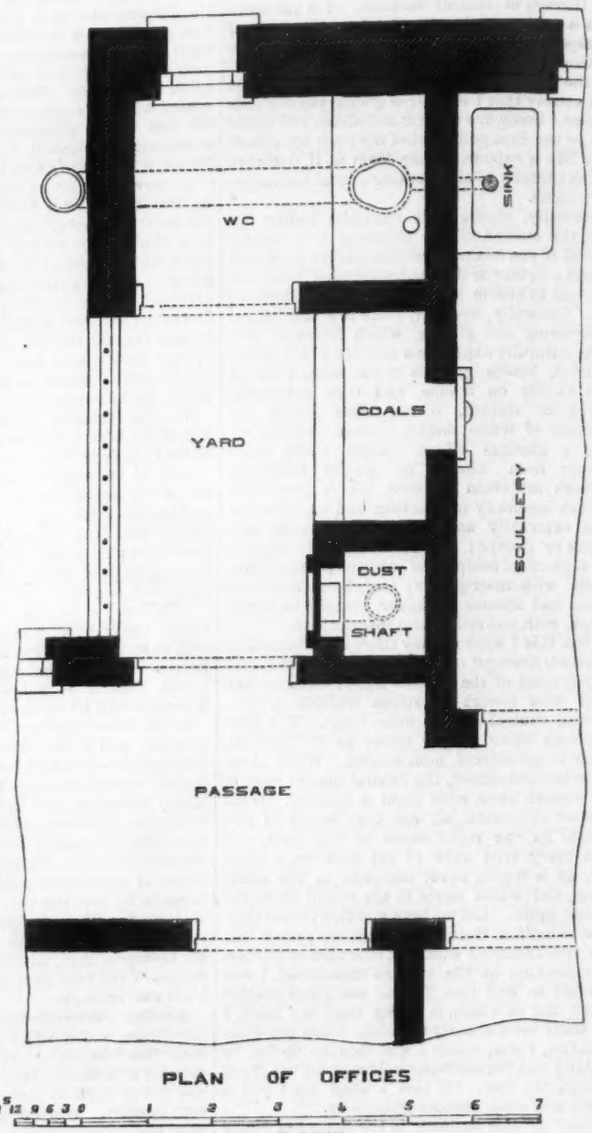
These streets, which are, of course, undisfigured by temporary fashions such as have left their odious mark on London and Paris, must, I verily believe, literally charm the savage beasts by the sustained melody and harmony of their architecture, which, I may say, has been fashioned by and truly reflects the national life. I am never weary in them. Their effect on the nervous system through the delighted mind prevents bodily fatigue. What strikes you forcibly is, that, though you are in a new world, where all is literally new, there should be no lack whatever of associations of the old. By means of sculpture and painting, poetry and fable, the muse of history, everywhere seems to haunt the city, and speak to its denizens through its other wise eloquent architecture. By these magicians all is touched with the magic of the past, and you sometimes feel even haunted by reminiscences of British and European glory. How learned, how accomplished, must be the architects! Such has often been my exclamation; for all my experience goes to prove that inspiration of genius, which, with little or no education, will sometimes produce a poet, will not alone make an architect; and to expose, to *my* mind at least, the fallacy of a very respectable writer of the last century, James Fegusson, who asserts that the finest buildings of India in his day were designed by workmen who could neither read, write, nor draw; an assertion which strikes at the root of all professional culture, and at the very existence of architecture as a liberal art; for if such men can conceive and produce in stone works like Mahommed Shaw's tomb at Bejapore, and one or two others I could name, which are among the most majestic structures on which the sun ever rose, where is the use of our professional training, and what peculiar inheritance have we in the honours or emoluments of architecture? To your tents, O Israel!—Yours, &c.

Scamozzi Smith.

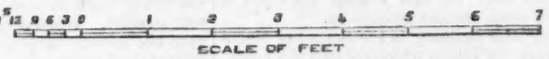
Fall of a Building in Sheffield.—On the 9th inst. the front foundations of the new building which is being erected in Anges-street, Sheffield, for Messrs. Cockayne, drapers, gave way, and caused a brick archway to fall. Two men were underneath at the time. One of them, an Irish labourer, named Hester, was buried by the falling bricks, and an iron girder also fell upon him.

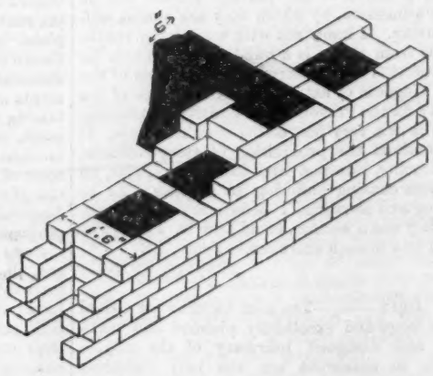


SECTION OF OFFICES



PLAN OF OFFICES





BRICK AND CONCRETE WALLING

IMPROVED DWELLINGS FOR THE INDUSTRIAL CLASSES.——*Details of Domestic Offices.*

IMPROVED DWELLINGS FOR THE INDUSTRIAL CLASSES.

Our readers will remember that the Improved Industrial Dwellings Company, presided over by Sir Sydney Waterlow, offered premiums for designs for dwellings for the industrial classes to be erected in Goswell-road. Particulars of the competition will be found in our volume for last year.* The first premium was awarded to Mr. Henry Macaulay, architect, of Kingston-on-Thames. In our present number we give some illustrations of his designs, and we will let the architect speak for himself in describing them.

The site in the Goswell-road, for which these buildings were designed, is of irregular form, having three of its sides to surrounding streets, with one obtuse and one acute angle with the Goswell-road, where it was desired that there should be shops with rooms attached, this being the most valuable frontage on the site; and by the four entrances being placed in the side streets, this frontage is left intact.

A list of conditions was issued by the company for the guidance of architects; these have all been complied with, and the further conditions considered equally necessary by the architect, "That no apartment in a dwelling should have to be passed through in order to enter another; also that the water-closets should not be entered from or by having to pass through any apartment, but have an interval of atmosphere circulating between each closet and the dwelling."

The general plan is the same for all the dwellings, which are approached from the rear by an external staircase, inclosed by side walls, and rising by half-flights, so as to avoid winders. From each alternate landing the doors of two dwellings open right and left on entering. There is a short, straight passage, with a window providing light and ventilation to it, and on the same side a door to the open lobby or space before named, which contains the waterclosets, at the end the coal-place, food-closet or larder, and the door to dust-shaft on the side. The door from the passage into this space can be left open at any time for ventilation with perfect safety, when the outer door from the staircase is closed and secured.

The scullery, living-room, and bed room or rooms, open from the sides of this passage, and when the windows and doors in these rooms are open there is not any portion of the dwellings which would not be purified by the passage through of the external air.

The ventilation, apart from the opening of windows and doors, is proposed to be obtained by making use of a sufficient number of the vertical shafts in the brickwork,—covering the openings to the same from rooms with finely perforated zinc, to avoid draughts.

The living-rooms would be provided with suitable cooking-range, and would have a good cupboard in one of the recesses; the sculleries a small fireplace and boiler, and iron or earthenware sink; and the bedrooms would have a small grate in the angle fireplaces, composed of fire-clay lumps forming back and sides, with the bars only of iron.

For convenience an opening would be made from the sculleries to coal-places provided with a sliding-door. Above the coal-places the larders or food-closets would be placed, and would therefore be external to the buildings, although under cover, the doors having finely-perforated zinc, to preserve the contents sufficiently cool and free from insects.

The dust-places are on the level of the basement floor, approached for cleaning from the outside, and the openings for each dwelling into the shafts would be protected from any back-draught by a self-acting iron door, always closed by its own weight when not in use. The shaft would be carried well up above the roof, and having openings on its four sides, and carrying, in its centre in the upper portion, a continuation of the soil-pipe, which would finish above the dust-shaft and act independently; but all bad air or gases arising from either source would be by this arrangement brought to the same point far above the roof, when they could be acted upon and dispelled by the action of the atmosphere. On the roofs of these buildings, which are flat and prepared for drying clothes, there would be opposite to each staircase, and for the use of the dwellings below, a bath-room and washhouse, having a boiler so placed as to be available for either, and the waste water from both would be made available for flushing the soil-pipe.

The buildings can be constructed in any of the usual kinds of walling; but to meet the desire for economy of construction laid down in the conditions, it is proposed to utilise the old materials on the site by converting them into concrete for internal walling, and as a filling for external walls which would be formed of brick-work, the internal and external faces having three stretchers and one header laid alternately, and breaking-joint at each course so that all the bricks would bond together, leaving vertical flues to be filled in with the concrete.

It is necessary to note that the copyright in these designs is the exclusive property of the company.

* See vol. xxxii., p. 475, and our present Volume, p. 2.

THE TOMB OF KEATS.

The tomb of the poet Keats, in Rome, must be an object of tender interest to all who have, in any degree, appreciated the power of his genius, and the sadness of his literary career. It stands in the disused burying-ground of the *Acatolici*, just within the city wall, towards the south, where the Porto San Paolo spans the Via Ostiensis. The pyramid of Caius Cestius rises beside it, in the pomp of heathenism, but long neglected, and now surrounded by a stagnant pool. There lies Keats, in breathless silence, beneath the plumage of the fir and cypress: a modest head-stone, bearing the following simple epitaph, marks the spot:—

"This grave contains all that was mortal of a young English poet, who, on his death-bed, in the bitterness of his soul at the malicious power of his enemies, desired these words to be graven on his tombstone:—
'Here lies one whose name was writ in water.'
February 24th, 1821."

How touching, and how untrue!

Hard by lie the remains of Gibson, Wyatt, and Bell; and not far off the "heart of hearts," which could not be consumed by earthly fire, when the body of Shelley was burning on the shore of the Gulf of Spezia; here, too, is a monument erected to five British sailors who were drowned when on duty from their ship off Fiumicino, "in May, 1825, as a testimony of respect and regret, by their captain," who has obtained for himself, by so doing, a place in the heart of every Briton who reads the words.

Though preserved from profanation by a dyke some 10 ft. in width and depth which surrounds the cemetery, recently the tomb of Keats had fallen somewhat into decay. Such a state of things could not last, and a young English lady commissioned Sir Vincent Eyre, who was interesting himself in the matter, to put it into better condition, at the expense of herself and a few friends. Simultaneously, a relative of the poet in America gave a similar commission to a countrywoman of hers in Rome: the parties joined hands, and have placed the tombstone on a better foundation, and have revived, by a permanent process, the original inscription, which had become almost illegible. A bed of daisies and violets has also been planted, in commemoration of the simple death-bed words of the poet, "I feel flowers growing over me."

It was originally proposed to open a subscription list in the hands of the British and American consuls in Rome, to afford a suitable opening to the enthusiasm which this subject has excited, and to obtain with the proceeds a medallion of Keats, from the mask in the possession of his stanch friend, Mr. Severn, which was taken in England when he was still in the bloom of health and youth. However, as Mr. Warrington Wood has generously volunteered to undertake the work gratuitously, this is now unnecessary, and the funds will be devoted to the execution of a bust, which, if, perchance, it cannot afford pleasure to him who is gone, will be deeply prized by those whom his works have taught to love him.

Lie still, poor Keats, till day of doom,
And recompense, break o'er thy tomb,
Then, a young lion loosed again,
Bursting from narrow cave amain,
With scornful roar thy tyrants greet,
All trembling at the Judgment-seat;
But when the trump thy wrath hath staid,
And worlds have heard the just decree,
Look toward the place where thou wast laid,
And know how some have cared for thee.

Hackney Marsh Sewer.—The Hackney District Board of Works have accepted the tender of Mr. Henry Potter for the construction of the Marsh Sewer, in accordance with the plans of the surveyor. The amount of the tender is 7,695*l*.

NEW PROCESS FOR THE PRESERVATION OF RAW MEAT.

Under the modest title of "Experiments on the Preservation of Raw Meat," Dr. Alexander Herzen exposed lately to an assembly of scientific men, at the Medical Academy of Florence, the results of long researches.

In the autumn of 1873, Dr. Herzen, after having retained in his house for many weeks certain cases of raw meat, preserved according to his system, put them to a further proof by keeping them in hot-houses, heated to tropical heat for two months more, without the meat being changed in the smallest degree from the state when first killed.

Determining to put them to a still stronger test of a journey across the Equator, a part of the same meat was sent to Buenos Ayres, where it was tested and eaten by a commission appointed there, who pronounced it excellent. Of the same meat, a part was returned to Europe, where it was distributed, still secured in tin cases, enclosed in wooden barrels, to many persons, who could find no fault either with the taste of the meat or its nutritive and digestive qualities.

The last of these tins of meat was eaten in Milan in the month of February last, eleven months and a half after the slaughter of the ox.

Among the examples of tests presented by Dr. Herzen was that of a glass vase of meat, the open top covered with a layer of melted fat only, the preserving liquid had partly evaporated, leaving the upper surface of the meat covered with mould. This was removed, when the meat beneath was found to be perfectly good, and having the smell of meat killed within a few hours.

Of the chemical, physiological, and histological properties still retained in the meat after long preservation, Dr. Herzen convinced the scientific men present, as also of the unexceptionable perfection in which the meat may be preserved. A small nucleus of about twenty-five gentlemen have hitherto formed the society, joining with Dr. Herzen in the expenditure necessary for carrying out the tests of his invention. These having proved eminently successful, means now will be taken to give publicity to the scheme.

The increasing dearness of meat in Italy, caused, during the last four years by the exportation of cattle to France, has made a serious increase in the expense of providing the army and navy. Great consideration is being given to the practicability of adopting the invention as a means of reducing considerably the balance both of war and naval expenditure, but more particularly of the latter. Dr. Herzen relies principally on the importation of cattle from La Plata, and estimates that he will be able to deliver the meat prepared at La Plata in the European markets, at a price a third less than that now demanded.

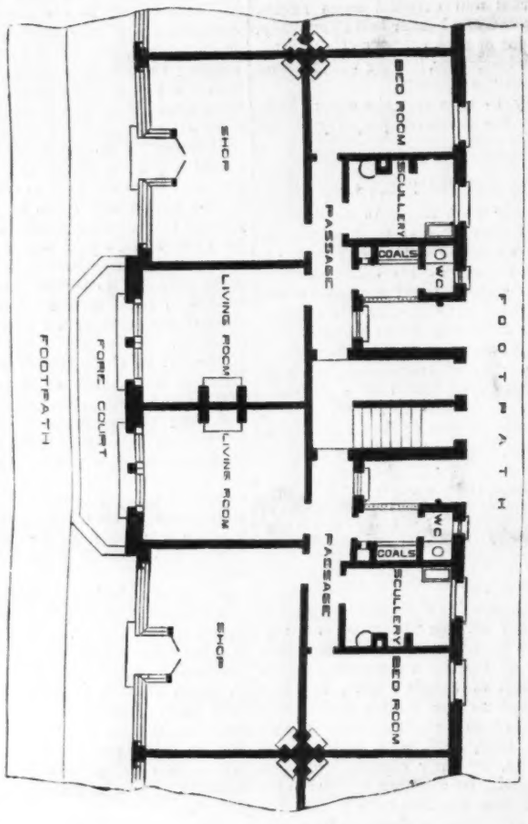
The account of Dr. Herzen's address to the Academy has been copied by French papers, and he and his coadjutors may now anticipate the attention of the commercial world of England to their enterprise.

WAKEFIELD MECHANICS' INSTITUTION.

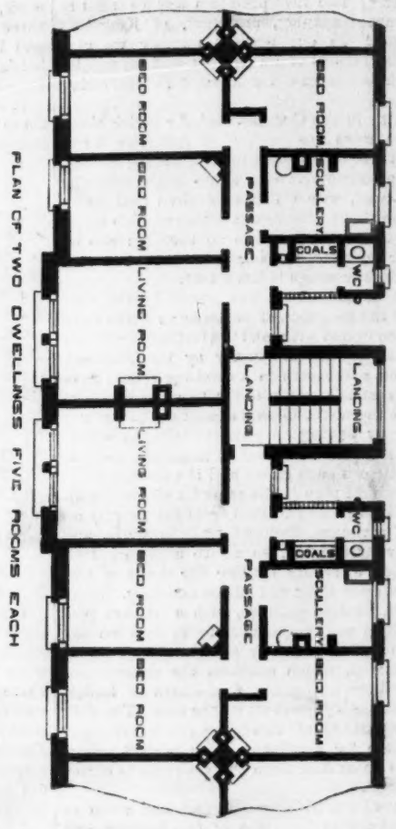
The staircase at this Institution has now been altered and completed, after being discussed for about seventeen years. It originally had winders in a semicircular apse, which were not only inconvenient, but dangerous, a gentleman having fallen over the handrail and injured himself so that he died. The lower half of the winders has been taken down, and a wide flight of straight steps fixed in the centre, with a new flight of winders up the right side to correspond with the old winders on the left side. The people can now get down the staircase from each side of the top landing, and go straight out of the entrance-hall, instead of all crowding out of the three doors to one end of the top landing, and finding themselves in a corner at the bottom.

The work, which was difficult (the new half-pace, or landing, is 12 ft. long, by 7 ft. wide, and weighs over three tons), was finished without any damage being done to the building. The architect was Mr. A. Hamerton, of Wakefield.

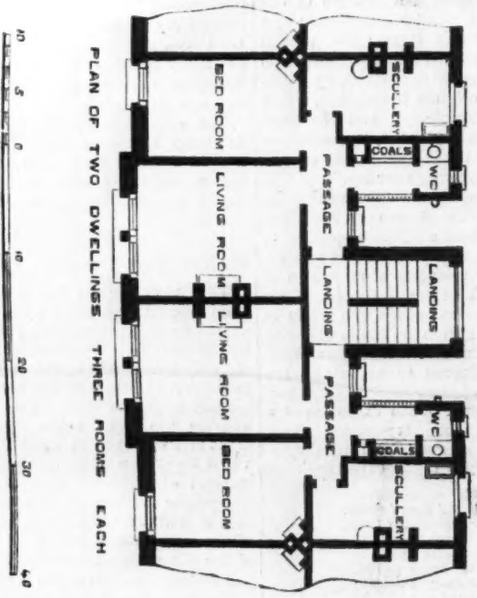
Messrs. Flower Brothers, of this town, contracted for the whole of the works, and sub-let the wood-work to Messrs. Harrison & Phillips; the iron-work to Mr. S. Kirk; the plastering to Mr. T. C. Tattersall; and the painting to Mr. C. Turner, all of Wakefield.



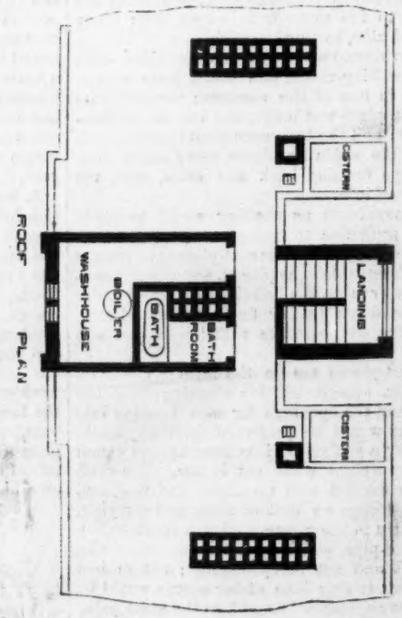
GROUND PLAN GOSWELL ROAD



PLAN OF TWO DWELLINGS FIVE ROOMS EACH

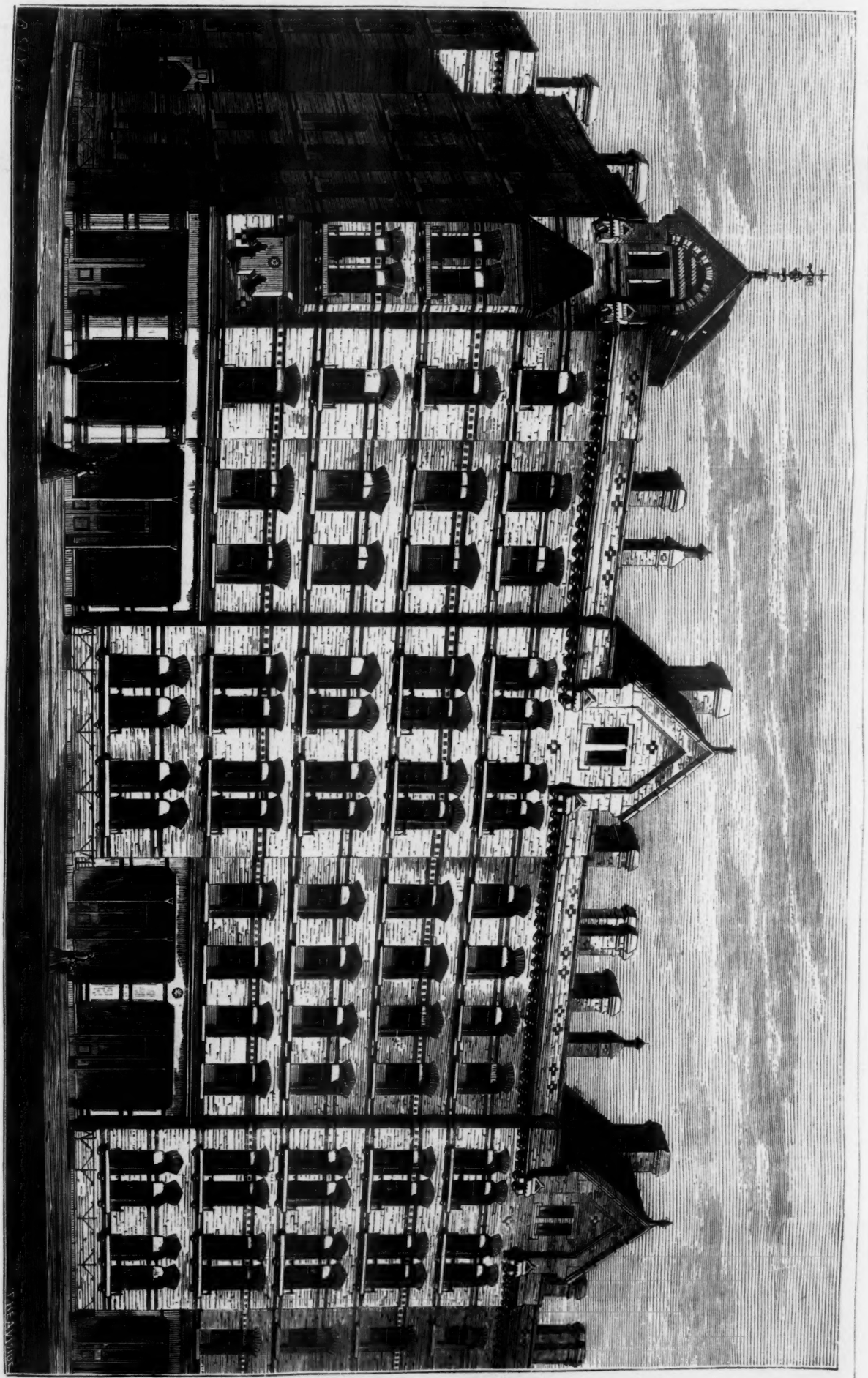


PLAN OF TWO DWELLINGS THREE ROOMS EACH



ROOF PLAN

IMPROVED DWELLINGS FOR THE INDUSTRIAL CLASSES.—*Plans.*



IMPROVED DWELLINGS FOR THE INDUSTRIAL CLASSES.—Prize Design by Mr. H. Macaulay, Architect.

NEVILLE'S CROSS AND ENGLISH HISTORY.

In the *Builder* of last week a short paragraph announced that "Neville's Cross" was in a state of danger. "Neville's Cross" is so intimately connected with English and Scottish history that the mere announcement fairly cries shame on those who may allow it to be destroyed.

On the turnpike road, about half a mile from the city of Durham, now stand the mutilated remains of this ancient stone cross, erected by one of our brave Border lords, the Nevilles of Brancepeth, in commemoration of the victory of the English army over David Bruce and his Scottish bands, at the battle of Red Hills, in 1346. An eye-witness states that all that now remains of the once elegant structure is the ruinous and earth-buried steps which form the base mound, and a large octagonal block of flinty sandstone, with traces of carved heads at the angles, but these have been so entirely defaced that it is utterly impossible to conceive what they may have been intended to represent. The rude shaft which springs from this block seems to have formed no part of the original cross, and is generally supposed to have been fixed there at a more recent date to serve the purpose of a milestone! The most diligent inspection of these rough and unshapely stones would never enable one to discover the form and construction of the primeval "erection."

Fortunately, Davis in his "Rites and Monuments" enables us to restore Neville's Cross, when the funds are ready. He says:—

"This cross had seven steps about it every way squared to the socket, wherein the stalk of the cross stood, which socket was fastened to a large square stone, being of great thickness, viz., a yard and a half every way: this stone was the eighth step. Also the said stone was fastened with iron and lead to the sole stone, which was three-quarters deep, and a yard and a quarter square about every way. The erected stalk of the cross was in length three yards and a half up to the boss, having eight sides, all of one piece; from the socket it was fixed into the boss above, into which boss the stalk was deeply soldered with lead and sodder. In the midst of the stalk, in every second square, was the Neville's Cross." A saltire on a 'scutcheon, being Lord Neville's arms, was finely cut upon the said stalk; and the bottom of the stalk was soldered deep in the hole of the socket, with lead and sodder; and at every corner of the socket was a picture of one of the four Evangelists, finely set forth, and carved in stonemason work. The boss at the top of the stalk was an octangular stone, finely cut and bordered, and most curiously wrought, and in every side of the nether side thereof, in the mason work, was Neville's Cross in a 'scutcheon in one square; and the bull's head, having no 'scutcheon, in the next square; so in the same reciprocal order about the boss.

On the top of the boss was a stalk of stone (having a cross a little higher than the rest), soldered deeply into the hole of the boss above, whereon was cut, on both sides of the stalk of the said cross, the picture of Christ, crucified, with his arms stretched out, his hands nailed to the cross, and his feet nailed upon the cross of the stalk below, almost a quarter of a yard above the boss, the picture of the Virgin Mary on one side, and the picture of St. John the Evangelist on the other side.

It will not be out of place to say a word as to "lead." Some thirty years back the writer, whilst on the spot referred to, found three of the nomadic Gipsies unearthing Neville's Cross, for the sake of the lead noticed by Davis, and there is every reason to assume that not only Neville's Cross, but other ancient monuments, have been destroyed, in order to get at the lead.

Dr. Raine, who, by the way, has not proved his researches and opinions infallible, says,—

"A cross was the usual boundary or marsh-stone between lord and lord, and most especially where three lords might have met and shaken hands with each other from their respective estates. The Nevilles were owners of Brancepeth, and in all probability the old cross might have taken its name from the fact that it stood upon the precise spot at which a man who was bound to my Lord Neville of Brancepeth would quit the great and much-frequented ecclesiastical way between Durham and Bearpark. The cross of the Nevilles,—I dare say the very saltire of the shield,—would remind a young Lumley or a Hylton of the place to which he was going, and would prompt him to spur on his steed till he had reached the side of the Prior of Durham, in whose suit he had ascended the hill, and wishing him solace at Beaurepaire, gently bid him farewell."

If this view of Neville's Cross be near the mark, the monument is of no more historical interest than an old finger-post; but Dr. Raine is merely guessing.

Years back, there was an "ancient" who contrived to pick up a stray half-crown from visitors to the bloody field of Red Hill; and a few years since a like local historian laid wait on the road from York to Tadcaster, to point out the *locale* of that fiercest of English battles between the Lancastrians and Yorkists—"Towton." There is good reason to assume that these old men inherited their knowledge from their ancestors, or men knowing the true site and circumstances from generations tracing back to the very period of the battles. In support of this, the guide at Towton, after describing on which side of the river Wharfe the opposing parties laid, exhumed "specimens," and proved that the wild white rose and the red rose only grew on the graves of those warriors who fought under those standards.

Certain it is, that the fragments of Neville's Cross stand on the very spot where the conflict at Red Hill was not only the fiercest, but where Lords Neville and Percy, with the fighting Bishop of Durham, beat King David of Scotland and the flower of the Scottish nobility. Local tradition also tends to show that it was on this spot that John Copeland, the Northumbrian giant, took the King of Scots prisoner.

As a memorial marking the graves of some 20,000 Scotchmen, and about 5,000 gallant Englishmen, Neville's Cross deserves a better fate than has up to the present time befallen it.

IRON AS A CONSTRUCTIVE MATERIAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At an ordinary general meeting of the session, held on Monday evening, the 5th inst., under the presidency of Mr. Henry Currey, Messrs. F. W. Albury, R. H. Carpenter, and A. H. Parker were elected members.

The Chairman regretted he had to announce the decease of Mr. George Vaughan and Mr. J. B. Waring, members of the Institute, after which Professor Kerr paid a tribute of respect to their memories.

The Secretary stated that the District Surveyors' Association had presented ten guineas to the library fund; and that Mr. E. Nash had given the proceeds of five shares in the Architectural Union towards the general funds of the Institute.

Mr. C. H. Driver then read a paper entitled "Iron as a Constructive Material." It was only of late years, he said, that iron, as compared with other metals, had been used as a constructive material; but it was known and employed for various other purposes from the very earliest times; and though it was now the metal of all others the most frequently used by, and was the best adapted of any to the requirements of, the architect or the engineer, it was but comparatively recently that its great value for building and constructive purposes had been fully appreciated, and to a certain extent utilised; and it was with the hope of showing that it might be employed in a still better manner than at present, he ventured now to refer to it. The earlier employment of gold, silver, copper, and tin by the ancients was due probably to the readiness with which these metals could be obtained, either in a native state, or from their ores, and the ease with which they could be worked as compared with iron, which was both hard to obtain and difficult to work, requiring great heat and labour to extract it from its ore. The vast store of iron which Britain possessed was quickly discovered and made serviceable by the Romans, who, however, worked it imperfectly. In the epochs in the history of iron, serving to mark the progress made in its manufacture, and intimately connected with its constructive use, viz., the employment of the artificial blast as a means of intensifying heat, and thus more readily reducing iron ore, the last process employed, which was published in the year 1856, was the invention of Mr. Bessemer, for converting iron into steel. Cast-iron was but little known or used in England till about the middle of the sixteenth century, but in the seventeenth century the art of casting had greatly advanced. It was likely, however, that cast-iron was known and utilised on the Continent earlier than in England. Mr. H. W. Brewer gave, in the *Builder* of July 16th, 1870, a drawing of a cast-iron stove from Coburg, which he stated to be of the fifteenth century, and "that it is remarkable, not only for its design, but for the material in which it is executed, there being not the least doubt that it is cast-iron, and probably the earliest example of the use of that metal." As early, however, as the sixteenth century, there was a proposition to erect on some Italian works then in progress a bridge in cast-iron, but though the idea was not carried out, it was worthy of note as showing that its capabilities were even thus early attracting attention; and though, between that time and the year 1777, the idea was frequently revived, it was not until then that the first bridge was actually built in iron. This bridge was constructed of cast-iron over the river Severn, near the village of Broseley, Coalbrookdale, Shropshire. From that time the use of cast-iron for bridge-building rapidly extended, culminating in Southwark Bridge, built by Mr. Rennie between the years 1814 and 1819. Since then cast iron had given place to wrought for all bridges of large span. Though the use of iron by architects in building structures had enormously advanced, the credit of discovering and applying the great advantage that iron unquestionably possessed over almost every other material to constructive purposes was due, he thought, to the engineers and not to the architects. Architects as a body had neglected and slighted this universally useful metal, either rejecting it altogether or employing it as it were under protest, and as if they were ashamed of it; they used it, in fact, as a drudge, and not, as he ventured to think that they should, as a valuable friend, equal indeed to most other building materials, and superior to some, valuable both for constructive and decorative purposes. While it was remarkable that they should have thus neglected it, the way in which engineers seized it was no less remarkable, for they with wonderful acuteness brought their science and practical knowledge to bear upon it, producing results that ought to be an example to architects; for as a rule engineers with regard to brick or stone paid architects the compliment of copying as well as they could architectural forms and practice; but with respect to iron the reverse was the case. Engineers finding that architects had done little or nothing with it, struck out a path for themselves, and it could not be denied had achieved a great success. He thought, however, that it was unfortunate, to some extent, that they did so, for it was in a great measure the cause of the want of appreciation iron obtained from architects, not because architects were jealous of the success of the engineers, but rather because of the disgust they felt at the inartistic result of their labours. Could this be remedied, and could iron be placed in its proper position with regard to architecture? He ventured to hope it might by taking advantage of the practical skill and knowledge which engineers had already obtained, and upon the foundation laid by them, advancing step by step, till they succeeded in finding uses for iron, both in construction and decoration, which, while perfectly adapted to the material, would yet combine and harmonise with those they had heretofore had in use. With regard to the principal attributes of iron, wrought-iron was very strong, bearing a working tensile strain of from five to six tons, and a compressive strain of from four to five tons per inch of section, and as regarded strength it was as twenty-seven to five as compared with oak, and as twenty-seven to four as compared with fir; and yet if it was employed as a beam or girder it was generally so swaddled up with cradling and plaster that as much room was taken up by it as if it had been a beam of oak or fir. Then, again, it was very light as compared with its strength, but by the same process as last mentioned, its weight was brought up to that of a wood beam. It was very ductile, easily hammered to any variety of shape, and yet almost the only form ever given to a wrought-iron girder when used in building was that of the ordinary rolled or plate girder. Again, iron, though very durable, was not an imperishable material, and this appeared to be practically forgotten, for though, unlike wood and perhaps stone, it was free from internal deterioration, yet it was liable to serious destruction by rust and oxidation of its outer surfaces, a most important point considering the fact that but little excess of material was usually employed than was absolutely necessary for the required work, and therefore it would be but reasonable to suppose that when used arrangements should be made by which all parts of a girder or column could be readily inspected, but in the system in vogue the reverse was the case, for the girder was so covered and hidden up that no inspection was possible, nor could any means be taken to paint or otherwise preserve it from the inevitable destruction that must result from rust. It was almost the same as regarded cast-iron; it was a material admirably adapted for columns from its fitness to bear great compressive strains, and by its very nature capable of assuming almost any form that architects may design, from a plain column to the most elaborate effort of ornamental art the mind can conceive; yet, as ordinarily employed, the cast-iron column was either a plain, round shaft, with a square cap and base plate, with gusset pieces

to strengthen their connexion with the shaft, or as a story-post, like a girder standing up on an end. This column or story-post was often covered with lath and plaster, and appeared in the glorified shape of a Doric, Ionic, or Corinthian column, with cap, &c., to match, or, as was the case in most shops, it was left in its native bareness behind a plate-glass front, and had to be wrapped up in glazed calico or baize by Mr. Showemoff, the window-dresser, who wished that ugly columns were out of the way. The idea that iron did not accord with other materials, and was unsuited for architectural forms, was a mistaken one. Did the hiding up of iron by other material produce the object intended, viz., better effect? And setting aside the principle of honesty and construction, was not the result obtained most unsatisfactory? For, owing to the introduction of iron, much larger spaces were bridged over without requiring columns and arches than heretofore, and hence there were produced a bareness and an apparent weakness, anything but satisfactory to the eyes. It was possible, however, that the eye might require some amount of education before it became accustomed to the use of iron and its employment in connexion with other material. For they were so accustomed to see beams, columns, and brackets of certain proportions, that they were at first sight shocked at the idea of detached columns of twenty-five or thirty diameters carrying great loads, or slender beams carrying a heavy building; and it was difficult to adjust their proportions with the styles of architecture they had in use. But he had hopes that architects would, if they gave the matter their earnest attention, with the sincere desire to succeed, produce designs for iron which, though not perhaps exactly in accordance with any existing particular style, should yet harmonise, even perhaps by contrast, with them! Iron sometimes met with other, but very different treatment from the hands of architects, and he hardly knew which was the worst, for instead of being hidden it was brought prominently forward; but then not as iron, but something else, such as stone or wood, especially so in the case of cast-iron, for not only was it made to represent the last-named, but it also appeared in the guise, or rather disguise, of wrought-iron. He might instance balustrades, vases, parapets, tracery, &c. A prominent example of its misuse in this way was seen in the parapet and spandrels of Westminster Bridge, though happily, however, these were not the work of an architect. There was, he thought, another reason why architects, as a rule, ignored iron as a constructive material, and that was perhaps the most general one, viz., few of them comparatively knew anything about it, never studying or looking upon it other than as the aforesaid useful drudge, and this more especially so with respect to wrought-iron, and as to cast, they might perhaps use it for columns, railings, finials, rain-water gutters and spoutings; but these they took ready designed from an ironfounder's catalogue, and they might or might not (which was more often the case) harmonise with the rest of their design, they thinking it not worth their while to take the trouble to design such things for themselves. Or, if they wanted a wrought-iron girder, they were, perhaps, able to work one out from the simple formula given in the various handbooks; or, as was more likely, they left it to the builders' foreman. But if the quantity required was large, and the work important, they then employed an engineer to work out the calculations, and as the engineer cared nothing about art, but a great deal as to whether his girders were strong and economical, it was very probable that the resultant work was ugly, and without doubt the ordinary plate girders and columns as used in buildings generally were ugly; the architect naturally enough then covered them up with a material he did know something about, and therefore could design in; but if the architect did but know and understand as much about iron, he would calculate for himself, and study to so design his girders or columns, or whatever else he might require, that the result should be artistic, and suitable to the structure for which it was intended. Surely architects, if they would, could so design their girders in wrought or cast iron that they should be pleasing and effective. Let them but take the trouble to draw them out and calculate for themselves, they would soon find it was easy enough to arrange flanges, webs, cover-plates, and angle and tee irons so symmetrically as to be pleasing, and still preserve the necessary scientific proportions, and the relation of the several parts to each other in a practical manner. Plates and angle and tee irons were now rolled in such lengths that very large spaces might be spanned by girders without any cover or junction-plates being required. Many varied forms, and even mouldings, could and would be rolled if manufacturers found there was a demand for them, and that it would pay to make the necessary rolls. As regarded riveting, he did not see why something better could not be done in this way than the ordinary round-headed rivet universally employed. The foliage to the cap of a column was often put on in such a way as to spoil an otherwise good design, by starting from the neck in a line beyond the face of the shaft, especially when the foliage was loose and put in separately, the reason being that the bell of the capital was in a line with the shaft, and the leafage put on, of course projecting beyond. The bell of the cap should be set back, which would allow the enrichment to be put in its proper position. Again, they might often see ornament in cast-iron spoilt by the clumsy way it was put together, commonly by ordinary square or hexagonal headed bolts and nuts. Now, as a rule, if proper attention were paid in designing the work, cast iron construction could generally be put together without requiring any bolts at all, or, at least, without showing them; but, if it *was* necessary that they should show they could readily be made ornamental. For instance, the ordinary square and hexagonal headed bolts and nuts could, by a few nicks with a chisel or file, be made like stars or flowers, and yet retain all their use and strength. Reverting for a moment to the point that the constructive employment of iron was of comparatively late date, it was worthy of remark the significant fact that the artists of the Middle Ages had brick and stone and other materials, but no iron,—at least, not in quantities they could make structural use of; and they made such good use of the materials they had, that architects and engineers were feign to copy them. It was, therefore, fair to suppose that if they had had iron at their command, as was the case now, they would have produced works in that material as admirable as were their works in others; and he was justified in assuming this from the wonderfully beautiful works they achieved in the ornamental wrought-iron work they did make. He could not help feeling, therefore, that to a certain extent the poor results they had accomplished, with all the facilities they had at command, was not a cheering instance of the progress of true art in these modern times. There was yet another matter closely connected with iron as a constructive material which required attention, and that was the relative positions in which wrought and cast iron should be placed, viz., whether in external or internal work, and this more especially applied to ornament. Now it was a certain and well-known fact that wrought-iron was much more susceptible to the influence of weather as regarded oxidation than cast, and though, therefore, there could be no question as to the superior art and beauty of wrought iron, yet it was a matter worthy of some consideration if it be not more advisable, for the sake of durability, to employ cast-iron for ornamental work externally, and confine their use of wrought iron to purposes of internal decoration. He was perfectly aware that in advertising the use of cast-iron ornament at all, he was touching upon dangerous ground, as he knew that among many of the highest authority there was a strong feeling against it; but be that as it might, the fact remained the same, that cast iron was better adapted for external work than wrought; and he was inclined to think that the feeling which undoubtedly did exist against it was due to the way in which it was misused, and that if the design were properly adapted to the material, one of the principal objections to its application was removed. He knew that it was said that cast-iron ornament was inartistic, showing no feeling, and utterly wanting in individuality, and vulgar in the extreme, so that cast-iron ornament had become almost a by-word; but surely it was unfairly treated, for might not the same be said of work in bronze? A work in cast-iron required to have a model prepared and a mould made, as also did a work in bronze. The work had to be melted and run into the mould, and it was the same with bronze; if the model were badly designed and badly executed, in either case the resultant cast would be bad also. There could be feeling, individuality, and refined art in the design, and art workmanship in the model for cast-iron as well as of bronze, and the fact that iron was cheap and bronze expensive did not detract from the one or add to the other. The great and general mistake made was the endeavour to make cast-iron ornamentation an imitation of wrought work, but if the idea was steadily kept in view, that they were working with a material that required to be run in a mould, and not worked with the hammer, he thought they would succeed in producing cast-iron ornament, which, if not equally a thing of beauty with wrought-iron, should still be worthy of admiration. But, whether they used cast or wrought iron in ornamental work, it would be better for the sake of durability if more attention were paid to the form they gave to it in external work, and in designing it the two great points to be observed were, he thought, the facility with which all parts were able to be reached by the painter's brush, and the avoidance of cup-like arrangements, of leafage and flower-work, which retained dust and moisture, and tended towards rust and decay, and this last especially applied to wrought-iron work, as the leafage was generally thin and crinkled, and therefore peculiarly liable to be affected and injured by rust. In cast-iron work such parts were usually filled up solid. With respect to iron as a constructive material, the different qualities of the metal used was a very important and serious point, much more so than at first sight appeared; for, as in the case of cast-iron, there was not only a great difference of strength in the different brands, but also in the same iron from the manner in which it was manufactured, and it was almost impossible to judge by the outward appearance of a casting whether the iron used was good or bad, for even when fractured it required skill and experience to do so. Though hardly touching upon this point, he wished to draw the attention of the members of the Institute to a very able paper upon "Iron Construction," read by Mr. Richard Moreland, junior, at the Architectural Association on January 9, 1874 (a report of which appeared in the *Builder*), for therein was contained a large amount of practical information, particularly useful to architects who might have occasion to use either wrought or cast iron. For works in cast-iron it was very necessary to pay particular attention to the patterns required. All patterns should be made in the best manner, no expense should be spared on them, and they should be inspected by the architect or his assistant before being cast from. As to the patterns of ornamental work, it was better that the drawings for them should in all cases be done to the full size, and completely show what was intended, so as to ensure the design being correctly rendered. And, in fact, it was better, if possible, to have these patterns prepared under the immediate superintendence of the architect himself. With regard to the drawings that were necessary for a work in iron, it must be borne in mind that in designing for ironwork everything must be shown clearly and distinctly by the drawings themselves; little or nothing should be left to be described by the specification beyond the quality, &c., of the material; therefore, in addition to the general drawing showing the work complete, there must be provided detail drawings of every part, showing each bolt, nut, bolt-hole, rivet, flange, gusset, or chipping piece required, for workmen in iron were accustomed to work to drawings for everything, and to drawings alone, and in this respect they differed materially from the joiner, who, if he were to see a door specified to be a 7 ft. by 3 ft. 2-in. four-panel bead, butt, and square door, would at once know what to do; but if that door, for argument's sake, had to be made in iron it would be necessary to show in detail the whole construction of it, tenon and mortise, rebate and panel, and not only was it necessary to show everything on the drawings, but every dimension must be put on in figures; nothing should be left to scale. Respecting the ornamental construction of ironwork, most of them knew what ornamental construction consisted of in wood or stone as opposed to constructing for ornament; but it was, he confessed, difficult to apply the principles which guided them in the last-named materials to iron, for though it was true they could, as he had said, so arrange their tee and angle irons, webs and plates, that they should be symmetrical, that was not all that was required, for true ornament did not consist in symmetry alone, though symmetry was a very important element in it. They were placed in the difficulty that almost any ornament they employed on constructive ironwork had to be itself constructed, thus flying in the face of the golden rule of ornament, which told them to "ornament our construction, and not to construct for orna-

ment." When working with wood and stone, and some other building materials, they could build in blocks or masses of material, and cut and carve them as it seemed to them best, and it could hardly be said that they were able to do this in the same sense in iron; but though they could not carve it, they could stamp, emboss, engrave, and even mould it, if they would, for machinery was now so powerful that mouldings, splays, chamfers, &c., could be executed in this material with nearly the same facility as in wood; and there was some ground for consolation in the fact that whatever difficulties they might have to encounter, with respect to having to construct for ornament in iron, the same difficulty had to be met with respect to all other metals; and he was inclined to take advantage of "there being no rule without exception," and make the exception in favour of iron and all other metals; but though they might have in some measure to construct their ornament, he thought they should be careful to so manage it that the ornament they did employ should not be wholly useless, and that if it did not add much to the strength of the structure, it should not, at least, be detrimental; and, therefore, all added ornament in ironwork should, he thought, be of the very lightest description, and if not actually constructive, it should at least grow naturally from and appear to be part of the real constructive portion of the work. In conclusion, he said that many of them, he knew, had already by their works anticipated his ideas with respect to constructive and architectural ironwork, and to them, therefore, his remarks, he feared, had been tedious; but, still, he hoped they would endorse his views, as he had been encouraged to maintain them by the knowledge that amongst those who stood the highest in their profession there were some who had not thought it beneath them to design in iron, and with successful results, and they would pardon him if he mentioned the name of their honoured president, Sir G. Gilbert Scott.

Mr. Payne stated that he had recently been constructing vaults and floors by a new method composed of concrete with iron, without girders and without thrust; and explained to the meeting several models which were exhibited in illustration of this new method.

Mr. Skidmore believed that because most of the architectural works of the past had been composed mostly of stone, everybody had come to the conclusion that stone was the proper material to be employed, and that metals were subordinate; but any one who had given their time to architecture must have been struck with the amount of metal that had been found at the Temple of Jerusalem, which had its columns covered with gold, the value of which would be about two millions of money. In the Temple of Assyria, and in almost every great architectural structure, there had been a great deal of metal used. He thought that castings in iron should be real, legitimate castings, not castings in imitation of stone; and referred to a column on the Great Western Railway Station, Paddington, of which, although he did not know where there could be found any form like it in stonework, the castings were true. He thought that in designing columns it was most essential that originality in their formation should be aimed at.

Mr. C. Fowler stated that, with reference to cast iron, it occurred to him that one reason why the employment of cast iron was so very unsatisfactory, was that the designers naturally enough could not help thinking at the time of what had been done in iron construction. The way to treat cast iron was not as iron at all, but as a cast material. With reference to beams, the difficulty was in combining the ornamental with the artistic form. As to wrought iron, it had always appeared to him to be extremely difficult to work, as the labour for it was very expensive, and the forms which it would most conveniently take were not those which they desired to show if a plain structure was attempted. If it was attempted to make the beams in an artistic form it became very expensive; and if cost were an object, the result was not very satisfactory. Mention had been made of the station at Paddington, where it had been attempted to ornament the wrought iron rigs by perforating them, and the light being seen through them there was a pleasing variety, the columns being certainly peculiar in form.

Mr. Matheson, a manufacturer in ironwork, said that architects used iron in an apologetic manner, and used it very sparingly, which he thought was to be deplored. It was a common belief that cast iron had no elasticity, which was a mistake, as cast iron could be used where there was a great deal of percussion. He contended, notwithstanding what Mr. Driver had said, that cast iron was quite as good for constructing bridges as wrought iron, and believed that the engineers, who were best informed in these matters, would say so. Even in roofs of buildings so large as that of the London, Chatham, and Dover Railway Station cast iron was not too brittle. He thought that if architects were a little bolder there were many uses to which cast iron might be put for which it was not now employed. With regard to the rust to which iron was subject, he thought that this was a difficulty in the way, particularly in a London atmosphere. He believed that much of the dislike to iron arose from the bad way in which it was executed. Architects should be brought in contact with the manufacturers of iron, and not be, as is the case now, at the mercy of the builders. In Paris iron would last much longer than in London. The rust to cast iron was caused in a different way to wrought iron. When cast iron was made there was a skin upon it, which was different from the iron inside, and which could be preserved by careful painting. Many engineers believed that iron should immediately upon its being manufactured be oiled; but he (Mr. Matheson) considered that it was impossible to preserve the skin, for it must come off sooner or later. There was one way of preserving iron, viz., by pickling it, which was a very similar process to galvanising it.

Mr. Skidmore stated that wrought iron was always pickled, which caused it to lose the scale entirely.

Mr. Aitchison said that with regard to wrought iron, it had many advantages. Generally speaking, it was more easy to work with regard to the artistic capabilities than cast-iron; it was open to almost any treatment the skill of the architect could give it. He went on to say that if there were amongst them any natural-born architects, nothing would give them greater delight than in overcoming the difficulty of constructing in iron, and in stamping forms in that metal of a pleasing shape; but hitherto that had not been attempted. He could not help thinking that they should look less at ornamentation than usefulness of form, and if that were done, they would find their duties simplified. Referring to cast-iron, he said that its use was a dangerous experiment, because the least flaw in the iron girder would ruin the building. In wrought iron, too, there was the difficulty of expense, but there was no doubt that it could be cut into almost any shape, but the great difficulty was to cut it in the plainest and simplest way.

Mr. Dickson considered that sufficient attention had not been paid to the advantages of iron as a constructive material, and if architects were to devote more time to the subject it was possible that more elegant forms would be produced than were produced now; and instead of clothing the cast-iron girders in shop-fronts and in buildings, they ought to have something more ornamental and more useful. He believed that if the architect of former times had had the advantage of iron, they would have shown by their skill the adaptability which it possessed.

Mr. Chatfeild Clarke said that the engineers had many opportunities of making iron ornamental and useful, but had not embraced them. When they looked at the hideous monstrosities which they met in various parts of London, they were astonished. With regard to the use of iron, the difficulty was not only the expense, but the expense of repose: there was no rest to the eye, and he doubted whether that difficulty could be conquered. All architects had found considerable difficulty in producing ornamental iron-work, which was owing to the careless way in which the iron-work was done.

Mr. Macfarlane believed that the great cost of iron had been caused by the deterioration of iron, for an immense deal of foreign matter had been introduced, and inasmuch as iron had to go through a good many processes, it must be costly. He was convinced, however, that if architects were to give their attention to iron-work there would be constructed much better buildings.

Value of Freehold Property near Regent-circus.—Nos. 316 and 317, Oxford-street, with extensive stabling and yard in the rear, the whole comprising about 3,000 superficial feet, with possession at Midsummer next, was submitted to auction at the Mart on the 7th inst. by Messrs. Rushworth, Abbott, & Rushworth, and sold for 22,550*l.*

A SELF-MADE MAN: MR. WILLIAM DUDGEON.

ONE who has done his share to make the industries of the Thames as they now are has passed away from us. We regret to have to announce the death, on the 1st instant, of Mr. William Dudgeon, a member of the well-known firm of J. & W. Dudgeon, the builders of the *Independencia*, and a host of vessels of divers forms and tonnages, for our own Government, our own merchant navy, and for the Governments and navies of a large number of foreign countries.

Mr. W. Dudgeon was the son of a village blacksmith, and was born fifty-seven years ago, in the village of Lyninghame, Haddingtonshire, Scotland. He, and his elder brother John, the head of the firm, had few advantages or opportunities likely to qualify them for the high position to which they were afterwards to attain. They were thrifty, and they were studious, and the two men have shown what can be done with the scantiest educational advantages, but their career does not show to what they might have attained with greater.

There are, or have been hitherto, few cases in Scotland of parents being brought before the magistrates because of their children not attending school. John Knox, the great reformer, secured a provision in Scotland by which every parish was provided with an "efficient" school, and hence the progress of the Scottish people.

The Messrs. Dudgeon had their village school education, and afterwards their trade training in their father's smithy. From the quiet country village they went out into the world, and, in addition to the few crude arts in metal-working and its applications, learned from their father, they acquired for themselves a practical knowledge of mechanical engineering, and passed through various grades until they became ultimately the heads of a firm employing, in busy seasons, as many as 2,000 men.

Messrs. Dudgeon had two establishments, connected by water communication, which were the Millwall Engine and Boiler Works and the ship-building yard at Cubitt Town. The first was entered upon in 1855, and the other in 1862. The deceased, Mr. William Dudgeon, has ever since it was commenced been at the head of the Millwall Works, acting in concert, of course, with his brother John, the head, and, it may be added, mainly the maker of the firm.

But this matters not now. A good man has gone who has left many to lament him.

VALUATION OF PROPERTY BY RAILWAY OFFICERS AND ARBITRATORS.

THE North-Eastern Railway Company have just found a wide difference in the valuation of lands, buildings, and good wills by their own valuers and that of arbitrators.

The property required to be taken for the new railway station at Sunderland and lines has been valued by the arbitrators as follows:—Sir H. Williamson, bart., has to be paid the sum of 19,942*l.* for his interest in the Sheepfold land and Graving Dock; Messrs. Vaux & Co. are to receive 15,285*l.* for their brewery; and 10,740*l.* are awarded for the premises of Messrs. James Hill and Joseph Huntley, the whole being nearly twice the value placed upon the property by the railway valuers.

SANITARY INQUIRY.

BUNTINGFORD HERTS.

MR. ROBERT MORGAN, C.E., the Local Government Inspector, conducted an inquiry on the 31st ult., as to the advisability of the Local Government Board granting a provisional order to empower the Rural Sanitary Authority to put in force the Lands Clauses Consolidation Acts for the taking, otherwise than by agreement, of certain land for the purpose of purifying the sewage of the town.

The land proposed to be taken, called Moss Mead, is about six acres in extent, and the property of Sir Henry Lushington, who, represented by his solicitor, Mr. Armstrong, opposed the granting of the order. Evidence in support of the petition was given by Mr. Hunt, the clerk to the Board, and by Messrs. Smith & Austin, the engineers, who proved that the land in question was suitable for the purpose, and was the nearest on to which the sewage could be taken by gravitation.

Mr. Armstrong objected to the scheme on the

grounds that the land was situated near a public road, and that a public footpath ran through it, and that in consequence a nuisance would be experienced. He showed that there was other land, called Rea Mead, belonging to Sir Henry, equally suitable and farther from the town, but he admitted he was not empowered to say that Sir Henry would consent to such other land being taken.

A great deal of correspondence was read, and a long discussion ensued between Mr. Armstrong and the Clerk to the Board, as to who was to blame for terminating the negotiations, that had originally taken place for the lease of Rea Mead by the Sanitary Authority.

The Inspector urged that unless Mr. Armstrong could say that Sir Henry Lushington would prefer to sell a portion of Rea Mead instead of Moss Mead, he was afraid the provisional order must go on.

No other opposition being offered, the inquiry closed.

RE-OPENING OF KIRBY MISPERTON CHURCH, YORKSHIRE.

ON Wednesday, March 31st, the old parish church of Kirby Misperton, near Pickering, was re-opened, after restoration. The work has occupied about two years. A new chancel, with sacristy, &c., has been added. The date of the foundation of the edifice is not known, but a church existed here within a hundred years of the Conquest. To this date may perhaps be assigned the old buttresses at the north-east angle of the nave, together with some of the walling near it, and probably part of the old chancel arch which formerly existed, but was removed prior to the present restoration. The lower portion of the tower is of thirteenth-century work, and there seems to have been a chancel of the same date. The old stone work originally built in the thirteenth century was pulled down and rebuilt in the eighteenth, and is now again replaced in the wall of the chancel. The nave and south aisle were probably rebuilt in the fifteenth century, and this alone of all the old edifice had retained its old character. The chancel and upper part of the tower were rebuilt during the last century, and the whole church had then been much injured.

The works just completed are briefly these:—The mean chancel of the last century has been rebuilt, the new one being on the lines of the old foundation, but more lofty, and with substantial walls and buttresses. It is 32 ft. long by 15 ft. wide, and lighted by three two-light windows on the south side, and a three-light window on the east, the latter being set high up in the gable. The roof is oak of a canted form, divided into panels by moulded ribs and carved bosses. The altar is placed higher than the nave, from which it is approached by six steps. Behind the altar is a carved stone retable or shelf projecting from the east wall. The costly frontal is from the architect's design, and has been worked by ladies at Wolverhampton, where the rector, the Rev. G. Body, formerly resided. Standing on the altar, on a moulded octagonal base, is a brass cross with *fleur-de-lys* terminations, in each of which is a large crystal. The two altar-lights are also of moulded and hammered brass, designed after old examples in Belgium. The metal-work was designed and manufactured by Messrs. Buckley & Co., of London and Bruges, under the supervision of the architect.

On either corner of the foot-pace on which the altar stands is a tall standard candelabrum of iron and brass, each holding fifteen candles. The pavement of the chancel is of antique tiles, by Mr. Godwin, of Hereford. The church is lighted by duplex-burner lamps, suspended by long iron rods, with brass mouldings. On the north side of the chancel is a spacious sacristy, with an organ-chamber, and a lobby entering into it and into the chancel. Within this vestry are built in two stone corbels and a moulded arch discovered in pulling down the old chancel. The nave has had its modern windows in the north wall replaced by traceried ones. Its roof is of open timber, covered with double boarding, with an air-space between for the purpose of warmth. The south aisle has been repaired, and a new roof put on. The whole church has been refloored, and the former pews have for the present given way to chairs. The work has been designed in the Perpendicular style of the fifteenth century, in harmony with that of the south aisle, and with fragments discovered in removing the old chancel. The church is heated by an underground stove. The restoration has been carried out by Mr. T. Wood, builder, of Pickering, from designs, and under the personal superintendence of Mr. C. Hodgson Fowler, architect. Mr. Nelson was Mr. Wood's foreman, whose skill and industry are commended. The cost of the restoration has been about 2,500*l.*

CASES UNDER THE METROPOLITAN BUILDING ACT.

IMPROPER MATERIALS.

ON the 19th of March, Mr. John May, a builder, was summoned before Mr. Ingham, at the Hammersmith Police Court, by Mr. Knightley, District Surveyor, for constructing the walls of a building in Thorncroft-road, Shepherd's-bush, in a manner contrary to the provisions of the Act.

Mr. Knightley stated that defendant had used mud and road scrapings for the purpose of building the walls instead of solidly putting the brickwork together with mortar properly compounded of lime and sand in the proportion of one of lime to three of sand. The fact of having used road-scraping was not denied on the part of the defendant; but he contended that notwithstanding this he had built in strict compliance with the Act, as it did not define what constituted mortar. He produced witnesses, one of whom admitted that the material used for mixing mortar was brought to the premises in slop-carts, and another witness stated as his belief that in cases where pit-sand was used it was merely with a view of imparting colouring to the work. Mr. Knightley produced a sample of the material complained of, which he explained consisted mainly of mud containing in addition thereto certain animal and vegetable matter, and therefore wholly unsuited for building purposes.

To erect houses with this was to deceive the unwary purchaser of house property, and was dangerous to the safety of the public. He proceeded to read extracts from the books of the profession regarding mortar, and submitted that although the Building Act did not specify its component parts as these books did, yet the District Surveyor, who previously to his appointment, was required to undergo an examination by the Institute of British Architects as to his knowledge of building construction (of which mortar formed a part), might be deemed competent to judge as to quality, and had a right to expect such mortar as his technical experience led him to demand. He called witnesses, who spoke to the inferior quality of the mortar used, and then asked the magistrate to make an order for the demolition of the building.

The magistrate, however, adjourned the summons for further samples, and on the 8th of April decided in favour of the District Surveyor. In summing up, he said:—"It is an unpleasant duty for me to have to decide in a question of this kind, but I can only go upon what is stated in the scientific books upon the subject, which represent that mortar should be composed of lime and sand only in certain definite proportions. It is admitted by defendant his mortar is not of that character, but that certain ingredients are introduced other than sand. If this were allowed the field would at once be open for any ingenious builder to import whatever he pleased and give to it any name which suited him; this sample is not in my opinion mortar, and is unlike anything I ever saw before." He then made an order for the demolition of the building to the extent named by the District Surveyor in his notice, allowing him the whole of his costs in the case.

It is to be hoped that this judgment will serve as a warning to other builders.

NEW BUILDINGS AT THE ST. PANCRAS WORKHOUSE.

THE St Pancras guardians have decided to add some new buildings to the Workhouse. At their last meeting a report from the Visiting Committee recommended the carrying out of a plan for the erection of a new dining-room, and the remodelling of the kitchen and laundry. It further appeared from the proceedings of the committee that Mr. Bridgman, the architect, had examined the foundation of the workhouse, in accordance with a request from the Local Government Board to that effect, and they recommended that a copy of the architect's report upon his examination be forwarded to the Local Government Board, stating that the guardians, being guided by that report, have not considered it advisable to underpin the building, and add a new front to it, as suggested by the Local Government Board. The recommendations of the committee were adopted, and it was stated that the cost of the alterations which the guardians proposed to carry out would be 6,000*l.*, as against 14,000*l.*, which would be the outlay if the plans of the Local Government Board were adopted.

Accident at West Hartlepool.—On Saturday, owing to the breakage of an iron bolt, a portion of the new chapel in course of erection, for the use of the United Methodist Free Church, in Burbank-street, West Hartlepool, which had been carried up a height of from 60 ft. to 70 ft., fell down. The damage is estimated at between 30*l.* and 40*l.* The men had just ceased work, and no personal injury was inflicted.

GASWORKS EXTENSIONS IN THE METROPOLIS.

THE several gas companies connected with the metropolis are now holding their half-yearly meetings, and from the reports and proceedings of some of them it appears that the continually-increasing demand for gas necessitates the construction of new works. The report of the Gaslight and Coke Company states that the consumption of gas in the company's district is proceeding at so rapid a rate as to render large and immediate extensions of works necessary to keep pace with it. It adds that the additions to plant are the more imperatively required in consequence of the closing for manufacture of the Westminster and Blackfriars stations. As regards the latter, the report states that a contract for the sale of the works has been entered into with the Corporation of London, for the sum of 170,000*l.*, which, when paid over, will be applied in reduction of capital. The report of the Phœnix Company states that the consumption of gas continuing to increase, a contract has been made for the erection of a gasholder to fill the tank constructed at Kennington in October, 1873; whilst the report of the South Metropolitan Company states that the increase of business necessitates constant additions to the works and mains of the company, and that the principal work now in hand is a new gasholder tank for the reception of a gasholder to contain upwards of 2,000,000 ft. of gas, which is expected to be ready for use before next winter.

A SURVEYOR'S POWER.

As is generally known, the laws of Scotland differ widely from those of England.

At a meeting of the Johnstone (Scotland) Police Commission, after a long and warm debate, and hearing objections, a motion was adopted by eight to three, to construct a larger sewer in the town, the cost of which was 1,250*l.*, as estimated by the burgh surveyor.

After it was resolved to proceed with the work, the town clerk, to the astonishment of the council, read a section of the Burgh Act, which empowered the surveyor to negative any decision of the Commission, if he were dissatisfied with the proposed construction of the works.

The surveyor, availing himself of this, at once condemned the proposed works; the result being that the whole proceedings of the Commission, which had been carried by such a large majority, became invalid, and it was proved that the surveyor was master over his supposed masters.

THE CHARTERHOUSE AND THE MERCHANT TAYLORS' COMPANY.

IN the proceedings connected with the entrance of the Merchant Taylors' Company into the new domicile of their school within the precincts of the old Charterhouse, recorded last week, there was much said, and said well, about reverence for antiquity. It is difficult to reconcile this noble talk with the wanton destruction perpetrated, under the sanction of this great Conservative Company, of the ancient buildings on the site which they have come to occupy. For what have they done? In order to make room for their new buildings, constructed, no doubt, on the most approved models and with the best modern appliances, under the direction of an architect of genius, the half of the old Carthusian Cloister, a relic of antiquity absolutely, I believe, unique in this country, and on mere antiquarian grounds deserving of the utmost consideration and respect, has been destroyed, and its place occupied by the new buildings, which project across its line. In an architectural point of view, this act of barbarity was, I am convinced, perfectly needless; in an antiquarian and conservative one it ought to have been avoided at almost any sacrifice. The destruction of this venerable relic seems to me to reflect the greatest possible discredit on every one concerned in the business. Unfortunately it is now irreparable.

H. W. PHILLOTT.

Improvements in Reading.—We hear that new premises for the London and County Banking Company are about to be erected in the Market-place, between Messrs. Morris & Sons' establishment and the house now occupied by Mr. Staveley. The architects appointed are Messrs. Wm. & T. J. Brown and Albury.

THE CHARING CROSS APPROACH TO THE EMBANKMENT.

THE building materials of the houses and other premises on each side of the site of Northumberland House, and which are about to be taken down for the new approach from Charing-cross to the Thames Embankment, were sold by auction on Tuesday and Wednesday this week, by Messrs. Horne, Eversfield, & Co. The property consisted of twenty-six houses, shops, warehouses, and stabling, and included five houses and shops facing Charing-cross and Trafalgar-square, situated between the National Bank and the south-west boundary-wall of Northumberland house, and two other houses and shops on the north-east side, leaving two other houses and shops adjoining yet to be disposed of, when the length of frontage to Charing-cross to be cleared away, for the purposes of the improvement, between the National Bank and Northumberland-street, will be about 500 ft. The sale also included the materials of twenty houses in Northumberland-street, in addition to Percy-chambers, with stables in the rear, at the bottom of the street, on the north-east side, together with a public-house and a shop in Scotland-yard, on the south-west side. The Northumberland-street property disposed of included the whole of the houses on the south-west side, from the boundary of the grounds of Northumberland House to Scotland-yard, and on the opposite side, from Northumberland-passage, leading into Craven-street, to the bottom of the street facing the Embankment. The materials of the several blocks of houses were divided into 283 lots, and comprised, according to the catalogue, upwards of 1,000,000 bricks, and 30 tons of lead, amongst other articles connected with building. The materials of the buildings in Charing-cross, comprising 133 lots, were sold on Tuesday, and those of the Northumberland-street property, containing 150 lots, on Wednesday, the proceeds of the two days' sale amounting to 1,850*l*. The ground is to be cleared immediately, preliminary to laying out the new street and approaches to the Embankment, the conditions of sale providing that the slates, tiles, and lead are to be taken away within two days after the sale, and the whole of the materials and brick-work to be removed within thirty days, after which anything left on the premises will be deemed a trespass. The entire area to be cleared for the purposes of the improvement is upwards of 3 acres in extent, which may be expected to be thrown open within a month from the present time. It may be added that, with the exception of a number of unsightly remnants of walls facing Charing-cross, the whole of the materials of Northumberland House have already been removed, and it is stated that their still remaining is owing to the default of some of the purchasers, who state that the materials are not worth carting away.

LIERNUR'S SUCTION SYSTEM OF DRAINAGE.

ON the 7th inst., at the meeting of the Society of Arts, Mr. Hawksley, C.E., in the chair, a paper was read by Mr. Adam Scott, on Captain Liernur's improved system of town drainage, now in use in parts of Amsterdam and other towns in Holland, and in several towns in Austria. By this system, before now described in our pages, the excrementa and such refuse are removed by pneumatic pressure. The town is divided into districts of from 200 to 1,000 acres according to local circumstances, each such district being again divided into small drainage areas, and each area is provided with one air-tight cast-iron tank placed at a convenient spot where two or more streets meet, and about 3 ft. under the pavement. From the tank along the several streets extend air-tight cast-iron main pipes, connected by branches with the closets of the houses. A vacuum is created in the tank, and the fœcal matter is sucked into the tank and from the tank again by a similar process into a central station. The matter collected at the central reservoir is converted into poudrette, and sold for agricultural purposes; but this part of the system, it was stated, has not yet been tested on a large scale.

We have never felt able to bring ourselves to believe that this system could be wisely adopted in our large towns. It is complex and costly; the mere fact that air-tight pipes and vessels are needed, and that a vacuum, more or less complete, must be produced, almost suffices to array one's instinct against it. It is only right, however, to say that the system has some active friends, and that strong evidence of its successful working in Leyden, Amsterdam, and elsewhere has been given.

THE MAUSOLEUM OF THE MEDICI, FLORENCE.

A WRITER in the *Times*, Mr. Richard Edgecumbe, having expressed some doubt as to a portion of the information we recently gave concerning the Medici Mausoleum, our correspondent in Florence says:—Mr. Edgecumbe is in error. The tomb opened was not that of Lorenzo il Magnifico, which is in the sacristy of the Church of St. Lorenzo, and who died at an advanced age, April, 1492, but was that of Lorenzo II., Duke d'Urbino, who died at the age of 26, March, 1519, and of Allessandro il Moro, his reputed son, or probably son of Clement VII., and who died in January, 1517. It is in the chapel of the Medici. This will suffice to explain to Mr. Edgecumbe his mistake. An error in the first notice may be corrected as the subject is again opened. The iron found, as we mentioned, by the side of the bodies in the tomb had probably been fixed to support the wooden slab under that of stone, and screwed into the wood to support it. It had corroded and fallen to pieces.

THE IRISH COLLEGE OF SURGEONS.

THE College of Surgeons, requiring alterations and additions to their premises at the Green, Dublin, offered a premium of 100*l*. for the best set of plans. Mr. William J. Symes, of the firm of Millar & Symes (architects and civil engineers), of Great Brunswick-street, has been selected for the premium. Mr. Symes, who is architect to the College, was asked for plans (a couple of years ago), which he furnished, but the Council, after a lengthened consideration, deemed it advisable to get other architects to send in designs in competition. Mr. Symes then sent in copies of his original plan, which were adopted. Ten sets of designs were sent in.

DAMAGE TO BUILDINGS BY LIGHTNING.

IN the middle of the day, last Monday, the city of Durham was suddenly cast into darkness, so that persons were unable to read or write. This was followed by a flash of lightning of extraordinary vividness, and a crashing peal of thunder, that made the inhabitants rush out of their houses into the streets. It was found that the lightning had done great mischief in various parts of the city, and it appeared at other places miles off.

The Rev. Mr. Greenwell's house, in the Bailey, and his neighbour's house, had their stacks of chimneys completely demolished. The bricks fell through the roofs into the bedrooms, and the lower parts of the dwellings were filled with smoke, dust, and soot. After striking the chimneys the electric fluid caught the spouting, and passed along the "down corner" into the earth, bursting in its progress the strong cast-iron spouting, breaking the chain of the cellar grate, bursting the water-pipes in the middle of the street, and several gas-pipes on each side of the way. This caused a great blaze of gas and conflagrations in several houses, which were fortunately put out by the inmates.

The pitmen at work in the mines were fearfully alarmed by the shock, expecting an earthquake was at hand.

PARISH PROSECUTION FOR A NUSIANCE.

ON the 7th inst., at the Marlborough-street Police-court, Mr. Thomas Codey, mineral water manufacturer, of 88, Whitfield-street, St. Pancras, was summoned before Mr. Knox for allowing the discharge of mineral waters and other offensive matters, the deposit of the residue from the manufacture of aërated waters, into the sewers, and causing a nuisance.

Mr. Cooper, solicitor to the vestry of St. Pancras, prosecuted, and Mr. Edward Lewis, of Great Marlborough-street, defended.

After evidence had been taken, Mr. Knox said he was prepared to give his decision, and after referring to cases decided by Justices Mellor and Blackburn, said there was a conflict of evidence in the case, one gentleman stating one thing and another gentleman another, but he felt compelled to rely on the testimony given by the medical gentleman on the part of the parish, and that the putting the refuse from these works into the sewer was injurious to the public health, and he should, therefore, made an order that the nuisance should be discontinued, and, if thought necessary, he would grant a case.

DAMAGES AGAINST A GAS COMPANY.

FARE *v.* THE BATH GAS COMPANY.

IN this case, tried at the Bristol Assizes, before Lord Chief Baron Kelly, Mr. Collins and Mr. Lewis were counsel for the plaintiff; Mr. Cole, Q.C., Mr. Lopes, Q.C., and Mr. Saunders were for the defendants. The plaintiff, who is a carpenter, resides at No. 1, Dalton-cottages, Bath, and the action was brought against the Bath Gas Company, to recover damages for injury which he sustained, at their hands, his furniture having been destroyed and his wife very seriously injured by an explosion of gas, which took place on the 22nd of January. The Bath Gas Company was an incorporated company to supply the citizens with gas, and they had the power to open the streets and lay down mains, and it was of great importance that they should take every precantion to see that their mains and service-pipes were in proper order, so as to prevent an explosion. Negligence having been proved, the Company agreed to a verdict for 350*l*. and to pay all certified costs.

COMPENSATION CASE.

AT the Guildhall, London, on Saturday last, the case of Frank Bouts *v.* The City Commissioners of Sewers came on for hearing. This was a compensation claim, amounting to 6,967*l*., and was made in respect of 21, Seething-lane, where the claimant had carried on the business of a licensed victualler.

The property in question was the "Pompion," and the claimant, the landlord of it, had been served with a notice by the Commissioners of Sewers, acting under the power of an Act of Parliament, to take the house for the purpose of a public improvement. His witnesses were Mr. J. J. Orgill, Mr. Thomas Fry, and Mr. J. P. Self.

On the side of the defendants, Mr. Lovejoy was called, and he estimated that 250*l*. a month would be the outside takings in the new premises. The net profits he put at 567*l*. a year, instead of 700*l*. as fixed by the claimant's witnesses. The cellar would be necessary for the business. Mr. Ryde fixed the gross profits at 1,083*l*., and, deducting the necessary charges from it, he estimated the net profits at 453*l*. per annum. He estimated that was worth to purchase by a tenant five years' purchase, or 2,265*l*. He did not think that any trade compensation should be allowed, the claimant having only the goodwill of a trade to sell.

The jury found for the claimant for 5,514*l*.

DANGER OF "STEEPLE JACKISM."

THOSE reckless men who are known to the building world as "Steeple Jacks," are continually "carrying their lives in their hands"; and it is questionable if the authorities at the Board of Trade or the police have not powers invested in them to stay such dangerous modes of repairing steeples, churches, and shafts as are now practised by men to earn a few pence per hour extra wages.

The last victim to the practice is Jack M'Millan, of Glasgow, who has just been smashed to a jelly at Kirkintilloch. He was employed tarring the high brick chimney-stalk of the Bellfield Chemical Works, and rested upon a small scaffolding suspended from a rope, carried over the top of the stalk by means of a kite, and secured on the other side. As he endeavoured to move round the stalk, his movements dislodged the rope, and he fell to the ground, a height of 80 ft. His breath was out of his body before he reached the earth.

Builders' Benevolent Institution. — An advertisement in our columns shows that an endeavour is to be made to get rid of the projected almshouses, and to apply the money in hand to the general purposes of the institution. We hope it will be successfu'.

USUAL FORM OF CONTRACT.

WILKINS *v.* WHITE.

THIS was an action in the Crown Court, Bristol (before Mr. Justice Lush), on the 6th inst. The plaintiff is a builder carrying on business at St. Paul's, in this city; and the defendant is a provision curer, in Castle-street. The action was for the recovery of 332*l.* 5*s.* 11*d.*, and the defendant had paid 172*l.* into court. It appeared that some time ago the defendant purchased a piece of building land in Cobourg-road, Montpelier, and entered into negotiations with the plaintiff to build two houses upon it. A price was agreed upon, and Mr. Harford was appointed architect. A contract was prepared between the plaintiff and defendant, and Mr. James Wilkins, on being told that it was in the usual form, signed it without reading it; but the plaintiff now averred that it was not in the usual form, and did not contain a strike clause.

The defendant pleaded a set-off of 60*l.* as penalties for the non-completion of the contract in the specified time; but the plaintiff contended that this delay was in consequence of the defendant not having supplied grates in proper time, and, moreover, that he had a strike of carpenters and joiners.

Verdict for the plaintiff for 60*l.*

ARCHITECTS AND WORKMEN.

SIR,—If you will kindly allow me space in your valuable journal, I should like to make a few remarks on the paper read by Mr. Thicke, at the Architectural Association, entitled "Relationship between Architects and Artisans." I perfectly agree with Mr. Thicke in the greater portion of his paper, but I must beg to differ from him in one or two particulars.

I think much good would result from a more free intercourse between architects and workmen, for much valuable information may be gained by the architect in matters of detail and practical construction. Although many workmen are far from being what may be termed educated, yet they possess good ideas of the best manner in which work should be put together. Some architects, at times, seem to forget in what material they are working, whether wood or stone.

I think every architect's pupil before he enters the office should have eighteen months or two years at the bench, and the same time at the mason's banker, and if this plan were adopted our future architects would be far superior to many of the present day, and they would better understand the nature of the material with which they were dealing. I have sometimes seen details of mouldings, &c., for stonework which were very suitable for wood, but perfectly ridiculous for stone; the fillets and some of the members so thin and undercut that they would scarcely weather a hailstorm; and a few showers and a frost or two have completely destroyed them.

Mr. Thicke's idea of placing the drawings in a conspicuous place on the works, so that all workmen may have free access to them is certainly novel, but he does not say if he would limit the hours of inspection to meal times, &c., or whether they would be accessible at all times: if the latter, I fear the contractor would scarcely agree with him on that point, as the men would be continually neglecting their work to inspect the drawings, and arguments would ensue on various points, to the great loss of their employer. The plans and sections of a building would be almost as intelligible to the greater portion of the workmen, as a map of the British Isles would be to a native of Madagascar. There would doubtless be some few intelligent workmen on the job who would probably understand them and profit by it, but their number is very limited.

The English workman requires to be educated up to this point; but I fear, from what knowledge I have of mechanics, that it will take a long time to accomplish it. Although technical education has made rapid strides the past few years, and is at present engaging the attention of almost all concerned in the education of this country, yet the workmen do not take it up with any spirit, but rather as a patient would a disagreeable medicine; they make a wry face, and gulp it down, doubtful whether it will do them any good or not. A FOREMAN BUILDER.

UNION CHAPEL, ISLINGTON, COMPETITION.

SIR,—If the interest in the above competition were confined to the competitors I should not trouble you with any remarks upon Mr. Waterhouse's extraordinary defence of himself in your last issue. But as it is of the greatest importance to the profession that competition should be decided upon fixed and fair principles, permit me to show how, in this instance, the Institute Rules and the appointment of an assessor have failed to secure the instructions being adhered to.

The committee invite designs for certain buildings, the entire cost of which is not to exceed 15,000*l.*, and they promise to appoint as their architect the author of the best design valued at that sum. They will also consider a design honestly estimated by its author if, in the assessor's opinion, it can be built for a sum not exceeding 10 per cent. additional. But they do not offer the *competitors* 16,500*l.* to deal with. The 10 per cent. margin is for the *assessor's* application, not the competitors. Any design sent in valued by the author at over 15,000*l.*, or by the assessor at more than 16,500*l.*, would be debarred the competition, and the committee reserved to themselves the right of withholding in such a case the 50 guineas to be paid to each competitor.

Upon what principle, therefore, did Mr. Waterhouse value designs sent in at the following figures—21,000*l.*, 18,750*l.*, 16,241*l.*, ex tower? Is it part of an assessor's duty to bring into the competition architects who have voluntarily excluded themselves? I have always understood the assessor's first duty was to determine which drawings conformed to the instructions, *and exclude all others*; then advise upon the merits of those conforming.

But Mr. Waterhouse, it would appear, has succeeded in bringing "Torcello," valued at 18,750*l.*, within the 16,500*l.* (which he did not upon his first valuation), by deciding that the tower need not be included in the estimate, though shown in the design. There was not a word in the Instructions to this effect. Style was left entirely to the architects, but the words "a campanile has been suggested" were added.

This suggestion it was free to the competitors to accept or reject. If they accept the suggestion, and dignify their designs by such an addition, in all reason it must be included in the 15,000*l.* The same might be said of the caretaker's residence, and "Torcello," I understand, omitted it, while all the other competitors not only show it, but include it in their estimate.

But admitting, for the sake of argument, that drawings might be beautified by towers, and not included. It is then necessary for "Torcello" or Mr. Waterhouse to show the value of that tower to be 3,750*l.*, or the buildings *minus the tower* must have been sent in *intentionally* above the stipulated sum.

Ought such conduct to be rewarded? Upon Mr. Waterhouse's own showing, the design he recommended is debarred the competition.

I need say nothing respecting the assessor's mode of valuing. All designs by the same schedule of prices!

The committee, I am sure, have desired to do nothing but what is strictly honourable. The means they took to be guided aright shows this. The profession will regret all the more that the result so far has been a signal failure.

T. LEWIS BANKS.

*** Two other letters to same effect received.

STAINED GLASS.

Norwich.—A stained-glass window has just been placed in the south aisle of St. Giles's Church, in memory of the late Mr. John Godwin Johnson, at the expense of some of his old pupils. The window, which has been executed by Messrs. Joseph Bell & Sons, of Bristol, is one of three lights, and tracery of the Perpendicular period of architecture.

Horncastle. — A coloured window to the memory of the late Mr. Harwood has just been placed in the centre window of the north aisle in the nave of St. Mary's Church. The window is in three compartments, the lights being divided into two panels each. The subjects are "Faith, Hope, and Charity," represented by three female figures. The west compartment is that of "Faith" holding a cross and Bible; the centre, "Charity," holding an infant in her arms with a little child clinging to the garments; the easternmost, "Hope," leaning upon an anchor. In the second panels are, beneath "Hope," "Daniel in the Den of Lions"; beneath "Charity" "Joseph embracing his Brethren"; and beneath "Faith" "Abraham offering up Isaac." The colouring is in imitation of old glass, of flat hues. The window was supplied by Messrs. Clayton & Bell, of London, at the cost of 100*l.*

Ollerton.—A painted window has been affixed in Ollerton parish church by Mr. Cecil G. S. Foljambe, to the memory of Mrs. Lumley, late of Cockglode, near Ollerton. The window has been supplied by Messrs. Heaton, Butler, & Co., of London. The subject chosen represents the "Twelve Apostles," with inscription underneath. This is the second window which has been placed in Ollerton Church by Mr. Foljambe.

Reading.—A new stained-glass window has been placed in the west end of the north aisle of this ancient church. The window was erected by Messrs. Clayton & Bell, of London. The edifice has been restored, and rendered free from debt.

Folkestone.—Two new stained-glass windows have this week been put in the baptistery of the parish church. They are the gift offering of a lady. The subjects are, "King Ethelbert, the first Christian King of Kent, being baptised by St. Augustine, the first Archbishop of Canterbury." The windows are from the studio of Mr. J. Kempe.

Wincott.—The east window in the church of St. Mary the Virgin, Wincott, has lately been filled with stained glass, in memory of Caroline, Duchess of Buckingham, who died on the 28th of February, 1874. The artist was Mr. W. H. Constable, of Cambridge. It is a three-light window, one light representing "Christ, with Martha and Mary," a second "The Resurrection," and the other "The Good Samaritan." The whole is surrounded with ornamental work, and the wheel tracery above is filled with a figure of "The Majesty," holding the sceptre and orb. Underneath is an inscription.

Waldershare.—A memorial window has been erected in the north aisle of Winchester Cathedral, in memory of the Countess of Guildford. The head and two side lights contain the escutcheons of the Warde, North, and Elliot families, with their mottoes. The middle lights are occupied by figures of Faith, Hope, and Charity, with the name in Latin under each, and the words "Conjugi," "Carissimæ," "Dulcissimæ," "Sanctissimæ" beneath, as the dedication to the deceased. In the three lower lights are figures of Truth, Humility, and Patience, with appropriate mottoes to each.

An Ophthalmic Hospital for Sheffield.—A new eye hospital is to be erected in this town at a cost of 13,000*l.*

Books Received.

The Law of Contracts. By David Gibbons (Lockwood & Co.) Third edition.

THIS, one of Weale's series, is a very compendious, full, and (what is more) intelligible digest of the working and results of the law, as it at present stands, in regard to all kinds of contracts between parties standing in the relation of employer and employed. The instances given are so numerous and diversified as to afford a precedent and example for almost every possible case. The duties and possible evasions of the employed form the larger part of the subject to be considered. The reciprocal undertaking on the other side is much less subject to complication. As Mr. Gibbons tersely puts it (p. 106): "The great duty of the employer is *to pay*." Among points interesting to architects may be mentioned the reminder, given on p. 7, that "a contract to erect a building in contravention of the Metropolitan Building Act cannot be enforced;" the same applying, of course, to all Building Acts framed on a similar principle. An architect refusing to certify a builder's work, from malicious motives, or on insufficient grounds, is in a false position, legally as well as morally: at least, it appears the builder can compel him to certify when there is no good ground for declining. In one case cited (p. 105), "the Court of Chancery interfered by putting itself in the place of the architect, and ascertaining the amount for which the architect ought to have certified." Whether the delinquent architect subjects himself to any penalty, further than the frustration of his designs, does not so plainly appear. A model form of builder's contract is given as an appendix. The clearly and strongly expressed chapter on the legal and other aspects of combinations to alter wages, &c., is well worth attention from those who are interested in such subjects. The author sums up the chapter thus: "A combination is always an evil, because it involves a stoppage of work; the things which would have been produced in the interval are lost to the consumer; the wages that would have been earned are lost to the workman; the profits that would have been made are lost to the employer, and the circulation of capital is impeded." We hope here be truths, though some people seem to be marvellously slow at getting at their full value.

VARIORUM.

LAST week's number of *L'Art* (published by Heymann, Chaussée d'Antin, Paris), includes a very interesting account of the explorations made at Miletus (the Athens of Ionia), in Asia Minor, at the cost of the Messrs. Rothschild, illustrated with engravings of some of the sculptured capitals and bases which were found, and are now deposited in the Louvre. The bases in particular are handsomely ornamented. *L'Art* is a weekly review, illustrated with etchings, as well as woodcuts, of a superior character. It is well conducted, and promises to be a valuable serial.——The oleograph picture, "Look at Me," given with the March part of *Little Folks' Magazine*, will delight thousands of children. The lowness of the price at which it is sold is remarkable.——The *Leisure Hour* says,—"There are as many beershops and gin-palaces as would, if their fronts were placed side by side, reach from Charing-cross to Portsmouth, a distance of seventy-three miles, and thirty-eight thousand drunkards are annually brought before the London magistrates."

The Institution of Civil Engineers.—At the ordinary meeting held on the 6th of April, Mr. Thomas E. Harrison, the president, in the chair, the first paper read was on "The Manufacture of Steel," by Mr. William Hackney, C.E. The second paper read was "On Bessemer Steel Rails," by Mr. Josiah Timmis Smith, C.E. The object of this paper was to endeavour, briefly, to show that, with care in manipulation and in selection of materials, Bessemer steel might be produced constant in quality, and that certain inexpensive tests might be applied which would absolutely determine the quality of the material, in most if not all of its characters, so far as was required for railway and structural purposes. After an extensive experience in the manufacture of Bessemer steel rails, the author could only come to the conclusion that the present system of inspection was highly unsatisfactory, and that, whilst it sacrificed a great number of rails, it gave anything but reliable results.

Miscellanea.

Japanese Architecture.—In architecture, the Japanese, like their neighbours, the Chinese, have produced nothing,—not even as much,—for the Chinese may claim the pagoda as essentially of their own creation and still peculiar to their race. The instability of the soil in Japan, from perpetually-recurring earthquakes, has probably precluded any development of an artistic kind in this direction. A roof supported on wooden pillars resting on the surface of the ground, and tied together above by connecting beams, the whole building rarely rising beyond a first story, is the construction which probably gives the greatest security against a swaying motion communicated from below. Walls are with them but screens to keep out the weather, and are never used for supports to the roof. That they should be poor, therefore, in architectural works may be a natural consequence of living in a land of earthquakes. No Taj, with its airy grace and symmetry, can soar into mid-air under the volcanic conditions of the soil. No minaret and lofty dome can give new forms of beauty to the eye, with all the mingled grace and solidity which so peculiarly distinguishes the Saracenic and Indian architecture. Not in this direction must we look for even the faintest indications of the artistic faculty in Japan. We must be content to search for these much nearer to the level of the eye, and inside their dwellings, rather than in any exterior adornments of Temple or of Damio's Yashiki.—*Sir Rutherford Alcock in the "Art Journal" for April.*

Monument to the Late Mr. Adam Black.—The grave of the late Mr. Adam Black in Warriston Cemetery is now marked by a handsome monument erected by the family. The place of interment being immediately in front of the vaults, the monument is built against the south wall, from which it projects fully 2 ft., occupying the whole space between two buttresses. In design, it is a characteristic specimen of the Decorated style of architecture. The front elevation, rising from a moulded base and string-course, is divided into three spaces, separated by slender columns, and spanned by pointed arches. Above the arches, the elevation is carried up into three gables, which spring from carved gargoyles, and are finished on the top with moulded skews, decorated with crockets. The centre gable, which rises to a height of 14 ft., terminates in a cusped wheel cross, while the two side ones, which stand a little lower, are surmounted with carved finials. The pillars which support the front arches stand clear of the back wall, and the intermediate space is covered in with groined vaulting. Under the centre arch, carved in raised letters on the back of the monument, is an inscription. The work has been executed by Messrs. Stewart M'Glashan & Son, Canonmills,—the material used being the free-stone from Binny Quarry.

Salisbury Gaol.—At the Wilts Quarter Sessions last week, Mr. Hussey presented the report of the Fisherton Gaol Committee. The committee had advertised for tenders for the building and site, and several tenders have been received. The highest was 6,305*l.*, from Messrs. Leach & Scammell, of Salisbury, which the committee recommended should be accepted; and they applied that, in compliance with the County Property Act, 1858, the site and buildings will be vested in the Clerk of the Peace for the purpose of making a conveyance of the same when sold. In reply to the chairman, the County Surveyor said he thought the offer was a fair one. He was of opinion from the first that the property ought not to be sold under 6,000*l.* Two tenders had been received for the material, from persons who could have held no communication with each other, and the difference between them was less than 25*l.* The sums offered left a very handsome balance for the land. The report of the committee was then received and adopted; and an order was made for the temporary removal of the county records to the prison at Devizes.

Restoration of the Parish Church, Sheffield.—The "good example" recently given by Rotherham in the matter of church restoration is likely to be practically followed by Sheffield sooner than was expected. The necessity for restoring the parish church here has long been apparent, and although it cannot compare with the noble edifice at Rotherham, that is no reason why the best should not be made of it.

Traffic at Hyde Park-corner.—In the Commons, on the 12th inst., Lord H. Lennox, in reply to Mr. Adam, as to whether any steps were to be taken to ease the block of traffic at Hyde Park-corner, said last session the right hon. gentleman stated to him the particulars of a scheme for remedying the evil. It was suggested that the foot-pavement in front of the Wellington Arch, 18 ft. wide, should be thrown into the roadway, and that the small gardens on each side of the roadway should be converted into footpaths. In that way space enough for two lines of carriages would have been obtained at that spot, but the narrow road of Grosvenor-place would have been left as it was, besides which the gardens belonged to the Green Park, and he had no right to appropriate them to such a purpose. He therefore did not see his way to carrying out that scheme. He now proposed to form a carriage-way across the park from Hamilton-place, passing under Constitution-hill to Grosvenor-place. That, he thought, would be the best plan to adopt, and a model of the proposed alterations would be placed in the library, for the inspection of hon. members.

A Stroll Round Fulham.—Our excellent contemporary, the *City Press*, in a series of sketches which it is publishing under the title of "Tours Round London," treated its readers last week to one of Fulham. "Originally," we are told, "Fulham was an immense parish, and included Hammersmith, and still includes Walham-green, where the Right Hon. James Stansfield,—a prominent member of the late Liberal Administration,—has still his little brewery. Fulham now has an area of but 3,960 acres. The West London Cemetery, consecrated in 1840, extends from the Fulham-road to what was Sir John Scott Lillie's grounds, now the great gymnastic resort of the choice spirits of that part of the metropolis. Opposite is the Normal School, surrounded by a brick wall. A Roman Catholic Church was erected in Fulham in 1850. In the parish are the Butchers' Almshouses. In the grounds of Sandford Manor House, about a mile to the east of Fulham, are two walnut-trees planted by Charles II. and Nell Gwynne. Perhaps no place near London is richer in interesting associations."

The Drainage of Richmond.—At a meeting of the Richmond select vestry, on the 6th inst., a report from Mr. Hawksley, C.E., as to the drainage and purification of sewage proposed to be carried out, to meet the requirements of the Thames Conservancy, was considered. Mr. Hawksley thinks the acquisition of a sewage farm, which, to be really useful, must have an area of 400 acres at the least, to be, on social and pecuniary grounds, quite impracticable, and states that it would cost at least 150,000*l.* He recommends the best-known system of defœcation and deodorisation. As a fit site for the works he selected about 4 acres of land in the low-lying ground of Petersham or Ham Fields. The probable cost is estimated at from 45,000*l.* to 50,000*l.*; and as the whole of the plant required for an ultimate population will not be required in the first instance, the immediate outlay, he thought, might be reduced by 10,000*l.* The working expenses are estimated at about 1,000*l.* per annum. After a lengthened discussion the adoption of the report was carried.

Exmouth.—The new premises of the West of England and South Wales District Banking Company in this town are now nearly complete. They are well situated in the open space called the Strand, and are built from the designs of Mr. Bruce Gingell, architect, of Bristol. The walls are of Berry Head limestone, and the dressings are partly of Bath stone and partly of Pocombe stone, which latter material is introduced into the window and door jambs. The roofs are covered with dark tiling, and the sky-line is broken up by a low tower. The banking-room is 30 ft. by 25 ft., and the counters, not yet fixed, will be elaborate specimens of mahogany work. The manager's room opens handily into the banking compartments, and several other spacious offices for bank and domestic purposes occupy the ground-floor. The upper rooms are to be devoted to the manager's private use. The works have been carried out in an excellent manner by Messrs. Herbert & F. Burridge, contractors, of Exmouth, Mr. J. Baker being foreman. The carving is by Mr. Harry Hems. Mr. W. Withecombe was the clerk of works.

Turkish Baths.—We understand that a site has been selected in the busy centre of Camden Town for the purpose of erecting Turkish baths.

A Memorial in Leeds.—After the death of the late Mr. J. M. Tennant it was determined by some of his friends to place a memorial of him in the Leeds Parish Church, in the rebuilding of which he had played a prominent part. The memorial, which has now been fixed, has taken the form of marble and alabaster arcading round the walls of the apse, with panels filled with mosaic figures of the Twelve Apostles, and was designed so as to harmonise with the reredos erected a few years ago. The structure was designed by Mr. Street. The marble and alabaster work has been erected by Mr. Thomas Earp, sculptor, of London. The mosaics have been executed by Messrs. Salviati, of Venice, from cartoons prepared by Messrs. Clayton & Bell, and have been fixed by Messrs. Salviati's artist. The cost of the whole will be upwards of 750*l.*

West-end Roads.—On the 6th instant, at a meeting of the St. George's (Hanover-square) Board of Works, held at the parochial offices, Mount-street, Mr. Clements presiding, the surveyor stated that for some days past complaints had been made of the smells rising from the principal roads in that parish, particularly the Buckingham Palace-road to Victoria Station, Piccadilly, Grosvenor-place, and Knightsbridge. In order to abate the nuisance, he proposed each morning to send out two sweeping-machines to go over those roads and remove the dry matter from them. He was of opinion that the nuisance arose from that dry matter. It was then resolved to purchase a road-sweeping machine, in order that the suggestion made by the surveyor might be carried into effect.

The late Mr. Owen Jones's Library.—Messrs. Sotheby, Wilkinson, & Hodge sold on Saturday last the library of the late Mr. Owen Jones, including the lithographic stones, copper plates, and wood blocks of his magnificent work on the Alhambra, which realised 200*l.*; Roberts's Holy Land, 23*l.* 10*s.*; Zohn (W.), Les Ornements et les Tableaux de Pompeii, d'Herculaneum, &c., 18*l.* 15*s.*; Revue Générale de l'Architecture et des Travaux Publics, 13*l.*; Reynard (O.), Ornements des Anciens Maîtres des 15me, 16me, 17me, et 18me Siècles, 17*l.* 15*s.*; Architectural Society's publications, 14*l.*; Boutovsky (M. de), Histoire de l'Ornement Russe du 10me au 16me Siècle, 10*l.*; Owen Jones's Plans, Elevations, and Sections of the Alhambra, 21*l.*

The Lord Mayor and Corporation of Dublin Committed for Trial.—On the 8th inst., at the Dublin Police-court, the Lord Mayor and members of the Corporation were committed for trial to the Commission on a summons brought against them by Mr. Gerrard, law-stationer, for allowing mud to remain on the streets. Mr. Gerrard had been summoned by the police for not sweeping the footpath opposite to his premises. He pleaded he could not keep the footpath clean owing to mud being allowed to accumulate on the road. He was fined 1*l.*, and then he proceeded against the corporation, which resulted as mentioned.

Church Struck by Lightning.—During a thunderstorm which passed over Todmorden and Hebden Bridge district, on the 6th instant, the steeple of St. Thomas à Becket's Church was struck by lightning. The pinnacle on the south-west corner was entirely demolished, and heavy pieces of stone were scattered in all directions in the yard below. No fewer than ten gravestones were smashed. A piece of stone, weighing about 3 cwt., fell on one of the wings of the church, and, piercing through the roof, smashed two spars and tore away the cross-beam. Several pews in the gallery and body of the church were damaged.

The Bishop of Ripon on Church Work.—The Bishop of Ripon laid the foundation-stone of St. Augustine's Church, Bradford, on the 8th inst. His lordship, in a lengthy speech, referred to the extension of church work throughout the country. He remarked that sixteen new churches had been built in Bradford during the last eighteen years. During the present century upwards of 4,000 churches had been built in England. This was surely the most practical proof that the church was not in any way declining, but was advancing with rapid and steady steps.

Building Accident.—We much regret to say that the accident to the Rev. Dr. Monsell, which we mentioned a fortnight ago, has proved fatal. On the morning of the 9th a relapse took place, and Dr. Monsell died that evening. The occurrence has caused much sorrow.

Church Restoration, Kettering.—The Duke of Buccleuch is about to undertake the restoration of Barton Seagrave Church, of which living he is patron. The undertaking has been placed in the competent hands of Mr. Carpenter, and the works will be commenced very shortly. "Barton Church, which bears the dedication of St. Botolph, is a building of unusual interest to students of church architecture arrangement, the successful treatment of which, for congregational purposes, will test the capacity of the architect."

The Moody and Sankey Hall.—The new hall which has been erected specially for Messrs. Moody and Sankey's services, between the Canal-road and the Burdett-road, Bow-road, was opened on the 9th inst. The hall is constructed to seat 10,000 people. There is a raised platform, while the building itself is of iron, with a wooden interior. The roof is divided into five arches, and the building is lighted from the roof, there being no side windows. Her Majesty's Theatre, in the Haymarket, has been prepared for the same persons.

The Shakspeare Memorial.—It is supposed that Shakspeare's birthday will be celebrated by the laying of a foundation-stone of a memorial theatre at Stratford-on-Avon. Mr. Charles Flower, of that town, has given a site, liberal donations have been contributed, and a birthday benefit performance will take place at Drury Lane on the 23rd inst. Among the objects contemplated is the establishment of a Shakspearian library, an art gallery, and a dramatic college, under cosmopolitan direction. It is not to be a commercial speculation.

New College at Clifton.—It is reported that New College and Balliol College, Oxford, have, in conjunction with the authorities at Bristol, agreed to found a new College of Literature and Science at Clifton. It is expected that 50,000*l.* for the new buildings will be raised in Bristol. New and Balliol Colleges have already subscribed 5,000*l.* each towards the foundation, and they intend to give a further sum to the endowments hereafter.

Great Western Railway New Locomotive Building.—Mr. J. C. Rees, builder and contractor, of Neath, has been favoured with the contract for the new and capacious engine-sheds about to be erected by the Great Western Railway Company, midway between Neath and Britonferry, on land adjoining the turnpike road opposite Penrhiwtyn. The cost of the building is estimated at between 25,000*l.* and 30,000*l.*

Death of Mr. William Tomlyn, Builder. The announcement of the death, on the 7th inst., of Mr. William Tomlyn, builder, Wrotham, at the early age of thirty-four years, will be read with regret by many of the residents in the district. Mr. Tomlyn had been honourably associated, as a builder, with the business of the neighbourhood, and was generally respected. He had made many friends, and much sympathy is expressed for his family and other relatives.

Four Men Buried by a Wall.—Large excavations are in progress on the site of an intended new blind asylum at Plymouth, and a wall having been undermined, it fell upon and buried the four men who were engaged upon the work. Two of them were taken out dead; the other two were not seriously injured.

Sewer Gas in Downing-street.—The new public offices in Downing-street cannot be occupied by the *employés* of the various departments for which they are intended in consequence of an escape of sewer gas. The engineer of the Local Government Board has been instructed to report upon this occurrence.

The Hampstead Hospital Agitation.—The Easter Monday holiday-makers' petition to Parliament against the proposed Hospital will be presented by Mr. C. T. Ritchie, M.P. for the Tower Hamlets. The petition is signed by 10,964 persons, and the columns of signatures measure 452 ft. in length.

Theatre Royal Sadler's Wells.—The lease, together with the fixtures and fittings of the Sadler's Wells Theatre, will be offered by auction at the Mart, Tokenhouse-yard, by Mr. Edward Hasleham, towards the latter end of May.

The New Boat-house of the Grove Park Rowing Club is now in course of erection. It is situated on a beautiful part of the old Devonshire Estate, between Barnes Bridge and Kew. Mr. Currey is the architect.

Wood-cutting Machines.—Protection has been granted for further improvements in steam or hand circular saw and band saw benches or machines, to Frederick William Reynolds, Southwark-street, Southwark, Surrey.

The Protection of Ancient Monuments.—After a long and interesting debate on Wednesday last, Sir John Lubbock's Bill for the Protection of Ancient Monuments was read a second time, 187 voting for and 165 against it.

The late Admiral Sir Robert Smart, K.C.B.—A monument in memory of this distinguished officer is now being erected by Mr. E. J. Physick, sculptor, over the family vault at Chiswick.

Building Trade at Nairn.—A general rise has taken place in the wages of masons, carpenters, slaters, and plasterers at Nairn, in consequence of the briskness in the building trade.

TENDERS

For sundry repairs and decorations for the Churchwardens of Limehouse Parish Church. Messrs. A. & C. Harston, architects:—

Land	£749 0 0
Ennor	594 0 0
Colls & Son	589 0 0
Killby	531 0 0

For Bishopsgate-chambers, on the site of 100 and 101, Bishopsgate-street Within, for Messrs. W. & S. Volckman. Messrs. A. & C. Harston, architects. Quantities supplied by Mr. G. P. Raggett:—

Killby	£6,383 0 0
Ashby	6,167 0 0
Thomas & Son	6,100 0 0
Brown & Robinson	6,081 0 0
Elkington	5,543 0 0

For erection of schools and house at Cove, Tiverton. Mr. W. E. Williams, architect. Quantities supplied by Mr. R. Carpenter:—

Roberts	£1,497 15 6
Woodbridge	1,225 0 0
Dover	1,210 0 0
Williams	1,175 0 0
Hamlin	1,125 0 0

For sundry alterations, &c., at the Adelaide Gallery, and 9, Adelaide-street, Strand, for Messrs. A. & S. Gatti. Mr. Henry Ough, architect. Quantities by Mr. A. L. Buzzard:—

Sawyer	£2,314 0 0
Hockly	2,070 0 0
Shapley	2,035 0 0
Howard	1,850 0 0

For Marsh sewers, for the Hackney Board of Works. Mr. Jas. Lovegrove, engineer:—

Pound	£12,999 0 0!
Crane	11,460 0 0
Crockett	11,200 0 0
Rose	10,472 0 0
Bloomfield	10,367 0 0
Coker	10,350 0 0
Dover	9,645 0 0
Ritson	9,500 0 0
Miller	9,495 0 0
Keeble	9,460 0 0
Williams	9,450 0 0
Gardener	9,400 0 0
Dabbs	9,400 0 0
Wainwright	9,400 0 0
Pearson	9,299 0 0
Paice	9,000 0 0
Waldram & Co.	8,995 0 0
Maxwell	8,986 0 0
Potter (accepted)	7,695 0 0!

For alterations and additions, South-street Chapel, Exeter. Messrs. Spalding & Knight, architects. Quantities by Mr. Fleetwood:—

		Extra for Pitch Pine.
Harris	£3,599 5 5	£107 0 0
Sharland	3,526 0 0	51 0 0
Westlake	3,313 0 0	37 0 0
Diggins & Vicary	3,250 0 0	30 0 0
Smith	3,215 0 0	50 0 0
Stratford	3,181 16 0	30 15 0
Hunt	3,154 1 0	50 0 0
Stephens & Son*	3,049 10 0	30 0 0

* Accepted.

For new warehouse and buildings at King-street, Hammersmith, for Mr. W. N. Troy. Mr. G. Saunders, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Braithwaite	£9,647 0 0
Rankin	8,904 0 0
Adams	8,689 0 0
Nash	8,195 0 0
Hollond	7,800 0 0
Nye	7,567 0 0
Thompson & Smith	7,536 0 0
Adamson	7,452 0 0
Hockly	7,322 0 0
Wilson	7,086 0 0

For rebuilding the Raven and Sun public-house, Russell-street, Bermondsey. Mr. John Viney, architect:—

Shurmur (accepted)	£1,764 0 0

For repairs to the Globe public-house, London-street, Tottenham-court-road. Mr. H. J. Newton, architect:—

Wells	£135 0 0
Bowden	129 0 0
Shurmur (accepted)	99 10 0

For the erection of four villa residences at Dulwich, for Mr. E. Downs. Mr. R. Peters, architect:—

Simpson & Baker (accepted)	£3,000 0 0

For alterations and repairs to No. 15, St. Dunstan's-hill. Mr. F. C. Notley, architect:—

Pritchard	£392 0 0
Greenwood	334 0 0
Shurmur	319[illegible]0 0
Hayworth	305 0 0

For two cottages and sundry repairs to property, Sandford-lane, for the Incorporated Society of Licensed Victuallers:—

Anley	£1,180 0 0
Grimwood & Sons	983 0 0
Lamble	973 0 0
Pickersgill	965 0 0
Cole	929 0 0
Wagner (accepted)	900 0 0

For the erection of children's hospital, Stepney. Messrs. H. T. & C. A. Legg, architects:—

Curtis	£13,030 0 0
Gammon	12,530 0 0
Wood	12,181 0 0
Perry & Co.	12,051 0 0
Hearle	12,033 0 0
Morter	11,787 0 0
Ennor	11,586 0 0

For construction of sewer outfall, low level sewer, and formation of roadway and sea-wall, at Torquay, for the Tormoham Local Board of Health:—

Wilcocks	£99,900 0 0!
Nowell & Robson	57,600 0 0
Downs & Co.	53,468 0 0
Pickering	45,999 11 8
J. & J. Bell	43,146 7 3!

For sewerage works at Swansea:—

Neve & Sons	£83,619 0 0!
Warmold & Dovenor	77,379 0 0
Thomas & Co.	59,726 0 0
Jones	57,750 0 0
Nott	53,383 0 0
Alway & Williams	51,784 0 0
White	51,317 0 0
Davis & Son	50,908 0 0
Jones & Jepson	50,529 0 0
Green & Dickon (accepted)	48,604 0 0!

For enlarging Mount Pleasant Chapel, Swansea:—

White	£1,600 0 0
Morgan (accepted)	1,600 0 0

For a house and shop, Caer-street, Swansea:—

White	£1,428 0 0
Watkins, Thomas, & Jenkins*	1,408 0 0

* Accepted.

For additions to the House of Correction, Swansea. Quantities supplied:—

White (accepted)	£1,845 0 0

For additions at St. Bartholomew's Hospital, Smithfield, for the Governors of the Hospital. Mr. E. l'Anson, architect. Quantities supplied by Mr. D. Campbell:—

Colls & Sons	£3,373 0 0
Ryder	3,040 0 0
Lucas, Brothers	2,958 0 0
Macey	2,949 0 0
Brass	2,896 0 0
Patman & Fotheringham	2,890 0 0
Holland & Hannen	2,890 0 0
Brown & Robinson	2,844 0 0
Adamson	2,812 0 0
Newman & Mann	2,673 0 0

For new offices and galleries, Charterhouse-street, Holborn. Mr. H. H. Collins, architect. Messrs. Batstone & Sons, surveyors:—

		Additional Partitions.
Temple & Foster	£10,379 0 0	£754 0 0
Manley & Rogers	9,776 0 0	920 0 0
Kelly, Brothers	9,544 0 0	800 0 0
Oliver	9,450 0 0	810 0 0
Merritt & Ashby	8,951 0 0	631 0 0
Kirk & Randall	8,650 0 0	750 0 0
Waldram	8,522 0 0	613 0 0
Lawrence	8,496 0 0	598 0 0
Newman & Mann	8,478 0 0	588 0 0

For new warehouse, Weston-street, Tooley-street, for Mr. Clere W. Hooper. Messrs. Newman & Billing, architects. Quantities supplied by Mr. John S. Lee:—

Brass	£9,999 0 0
Dove, Brothers	9,695 0 0
Colls & Sons	9,275 0 0
Little	9,150 0 0
Macey	9,034 0 0
Moreland & Nixon	8,965 0 0
Brown & Robinson	8,836 0 0
Patrick	8,730 0 0
Perry & Co.	8,649 0 0
Hill, Higgs, & Hill	8,594 0 0
Turner & Sons	8,577 0 0
Tarrant	8,500 0 0
Downs	8,480 0 0
Merritt & Ashby	8,464 0 0
Newman & Mann	8,436 0 0

For the erection of Henham and Chickney Board schools. Mr. George Perry, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

		Allowed for Old Materials.
Cole	£1,142 0 0	£30 0 0
Glasscock	1,100 0 0	net. —
Davies & Ratcliff	1,070 0 0	24 0 0
Wiffin	940 0 0	20 0 0

For the erection of an additional tun room and malt store, &c. (first contract), for Messrs. Reid & Co., the Brewery, Liquorpond-street. Mr. Geo. Scamell, architect. Quantities by Messrs. Curtis & Son:—

Chappell	£8,313 0 0
Holland & Hannen	7,544 0 0
Cubitt	7,479 0 0
Brown (accepted)	7,460 0 0

For rebuilding the Odiham endowed schools and master's residence, &c., Odiham, Hants. Mr. E. Woodthorpe, architect. Quantities supplied by Messrs. Welch & Atkinson :—

		If old tiles re-used deduct.
Filewood	£4,085 0 0	£90 0 0
Bull & Sons	3,965 0 0	75 0 0
Jarrett	3,848 0 0	46 0 0
Rapley & Son	3,635 0 0	—
Crook	3,594 0 0	46 0 0
Newman & Son	3,350 0 0	60 0 0

For additional cellarage, &c., at No. 13, Southampton-row, W.C., for Mr. Payne. Mr. W. S. Trehearne, architect :—

Macey	£539 0 0
Adamson	510 0 0
Colls & Sons	403 0 0

TO CORRESPONDENTS.

J. McD. (has doubtless received reply before this).—F. C. (will send MS. to *Nature*).—R. H. (should have pointed out what is erroneous in the report).—M. T.—G. H.—J. R. R.—G. L.—R. L.—F. I.—H. H. R.—A. C.—F. C.—T. H —E. W.—W. B.—Mr. W.—F. M.—R. J.—R. G.—C. F. F.—Messrs. B.—R. P.—J. R. W.—A. & B.—R. W. W.—R. J. P.—J. R.—W. G. S.—G. M.—A. R.—Old Architect.—M. & S.—Athens.

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R. J. CHEESEWRIGHT, Clerk.
Town-hall, Croydon, 13th April, 1875.

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R. J. CHEESEWRIGHT, Clerk.
Town-hall, Croydon, 13th April, 1875.

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Ludlow, 13th April, 1875.

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W. WICKHAM, Clerk to the Board.

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